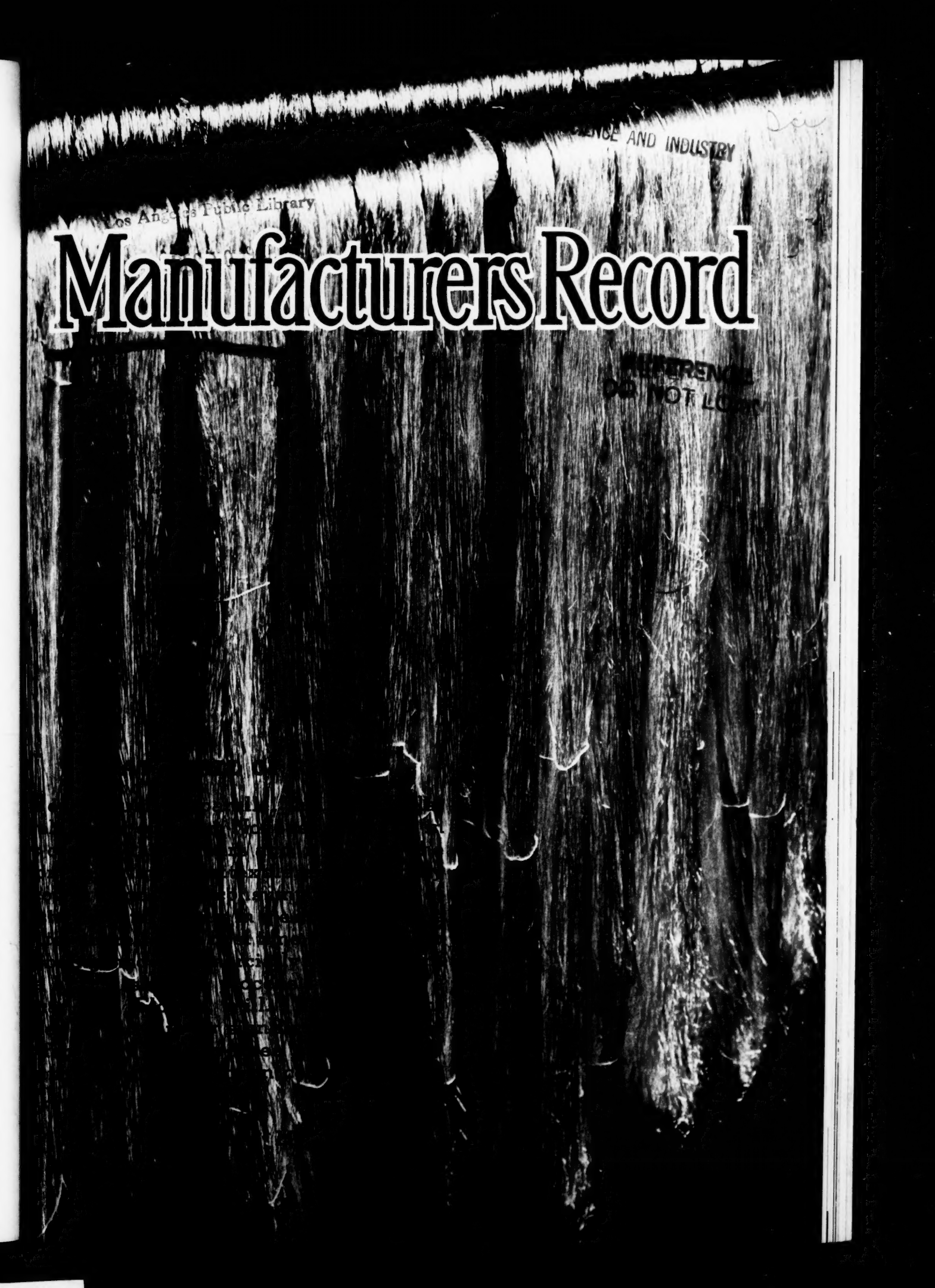
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NCE AND INDUSTRY
REFERENCE
DO NOT LOAN

FROM his window the Superintendent of a chemical processing plant saw the stacks belching smoke that turned day into night. It happened before—just recently.

He suspected boiler trouble. "Maybe, there's one reason for production delays!" He grabbed a phone. "Why the blackouts, Bill?"

"The forced draft blower is acting up," replied the engineer, "the valve in the steam line's gone out again!"

Only a short time ago this valve was repaired. Yet, again, it was causing irregular boiler operation and fuel waste; in fact, it might have crippled the boiler completely! That's how Preventive Maintenance—the modern way of protecting against trouble by stopping it at the source—came into the case.

The engineer knew that valves shouldn't behave that way. But he wouldn't risk ordinary repair again. And through the Crane Man, R. B. H., he would benefit from Crane's wide experience and knowledge in applying the best corrective measure.

The first step in applying Preventive Maintenance is making sure that valves and fittings are right for working conditions.

Here was a renewable disc valve in the steam line to a turbine-type blower. It couldn't stand the "gaff" of constant throttling. The disc wouldn't last. The draft blower ran wild!

Preventive Maintenance counseled replacement with a Crane No. 14½P—a plug type disc valve designed for tough throttling jobs. Its materials and construction would safely resist the ravaging effects of throttled steam. It would give unvarying control of flow—keep the blower running at constant speed.

RESULTS: No more blackouts even after two years. The menace of interrupted boiler operation, fuel waste, even complete shutdown was eliminated with Preventive Maintenance. Another user of piping knows that the Crane Man can help get most for piping maintenance dollars. Because, Crane is not only the source of valves and fittings for every need, but also of accurate information on their proper usage.

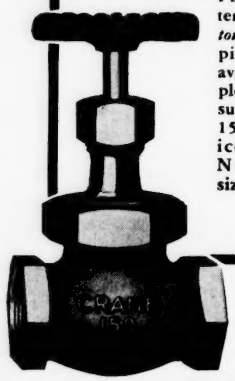
This case is based on the personal experience of R. B. H., a Crane Representative in our Minneapolis Branch.

TOUGH FLOW TAMED WITH CRANE BRASS PLUG DISC VALVES

In your boiler room—in any lines requiring severe throttling, you'll find these valves exactly right for the job. They're sound protection against trouble in blower, blow-off and boiler-feed services, in drip and drain lines.

The unusual stamina of these Crane valves is in their plug-type disc and seat construction. Materials are just the right combination for highest resistance to the corrosion and erosion of actual working conditions. The wide seating area repels the damaging effects of wire-drawing and foreign matter; assures long-lasting tightness. The tapered disc provides easy, positive regulation of flow.

With Crane Plug Disc valves, you can apply money-and-trouble-saving Preventive Maintenance to all the *tough* spots in your piping. They're available in a complete range of pressure ratings. For 150 pound services, specify the No. 14½P—in sizes up to 3 inches.



1940 our 85th YEAR

CRANE

CRANE CO., GENERAL OFFICES: 836 S. MICHIGAN AVE., CHICAGO

VALVES • FITTINGS • PIPE
PLUMBING • HEATING • PUMPS

NATION-WIDE SERVICE THROUGH BRANCHES AND WHOLESALERS IN ALL MARKETS

For Grinding and Polishing

in the Southern Stove Industry

NORTON WHEELS AND ABRASIVE

FAST cutting, long lived grinding wheels of Crystolon abrasive — they are popular throughout the southern stove industry for snagging castings and surfacing tops. Made of hard, sharp silicon carbide produced in Norton Company's own electric furnace plant, Crystolon Wheels are specially designed for the economical grinding of cast iron.

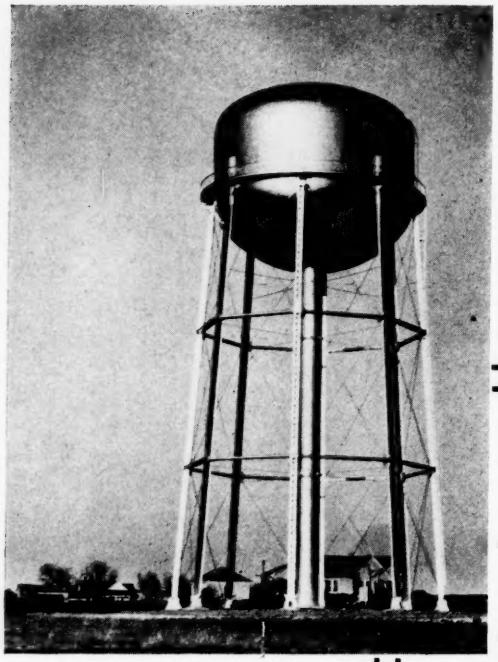
And for the polishing operations after grinding there is Alundum Abrasive—another product from the Norton electric furnace plant. Special manufacturing methods assure uniformity of grain size and shape and special surface treatments give the grain high capillarity — extra "sticking power" to stay on the wheel head until its job is done.

Through the South there are Norton distributors with Norton Grinding Wheels and Polishing Abrasive in stock. Write for the name of the nearest.

NORTON COMPANY
Worcester, Mass.

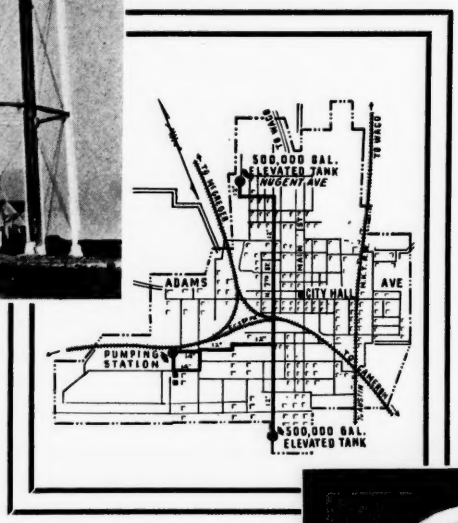
W-784

NORTON ABRASIVES



TEMPLE, TEXAS

installs two 500,000 gallon tanks . . .



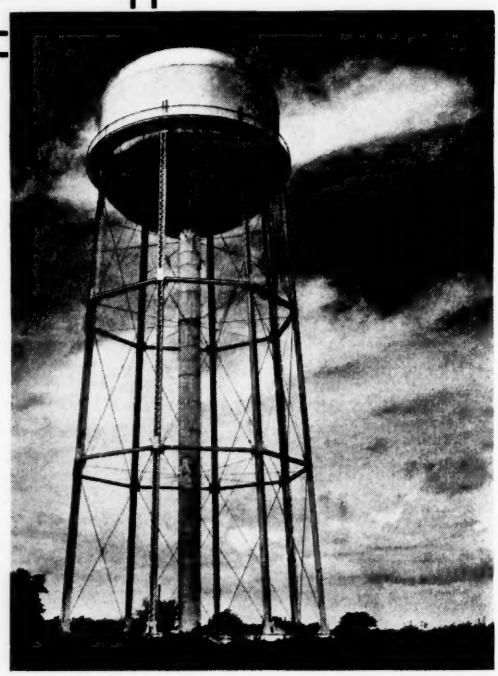
. . . . on opposite sides of the city.

Above, 500,000-gal. tank on the North side at Temple. The tank on the South side is shown below. Both are ellipsoidal bottom and roof design. Koch & Fowler of Dallas were the Consulting Engineers.

HERE is another case history that shows how a city can improve its water distribution when elevated tanks are used to provide gravity pressure in the mains. Previous to a few years ago Temple, Texas, relied on a 300,000-gal. standpipe 100 ft. high to provide storage in its waterworks system. Since the standpipe was located on ground 20 ft. lower than the average elevation of the business district, and much lower than some of the residential districts, the pressure was unsatisfactory. Furthermore, this system did not meet the requirements of the State Fire Insurance Department.

When the standpipe was finally abandoned, direct pressure was maintained by the use of booster pumps. This proved satisfactory for a while, but it was necessary to keep the pumps running constantly.

In 1938 the city started to modernize the entire water and sewerage system. To meet State fire insurance requirements, 1,000,000 gallons of water storage had to be provided, as well as an average pressure of 60 lbs. in the business district mains. These conditions were adequately met by the installation of two half-million-gallon elevated tanks located on opposite sides of the city. Since their installation the pressures in the system are almost constant, and the pumps are operated periodically. Write for information or estimating figures on elevated tanks of standard or special design.



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Tulsa	1611 Hunt Bldg.	San Francisco	1040 Rialto Bldg.	Havana	Edificio Abreu 402

B-788

Plants in BIRMINGHAM, CHICAGO and GREENVILLE, PA.

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MANUFACTURERS RECORD

Devoted to the Upbuilding of the Nation Through the Development of the South and Southwest as the Nation's Greatest Material Asset

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Member A.B.C.

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Investigate!

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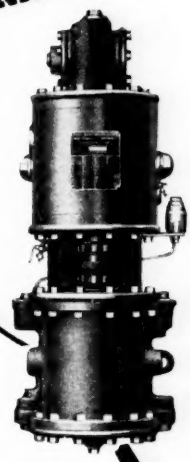
ONE of the MANY Types



Single Stage Steam Driven

Sturdy locomotive type. Gives long-time service for factory use. Easily installed on post, wall, or stand. For 80 lbs. air and 100 lbs. steam. Sizes 35, 49, and 66 cu. ft. Larger size available, 150 cu. ft., two stage type. » » » » »

Also many types of motor driven compressors up to 200 cu. ft., having exclusive features, and noted for economy, reliability, and durability. »

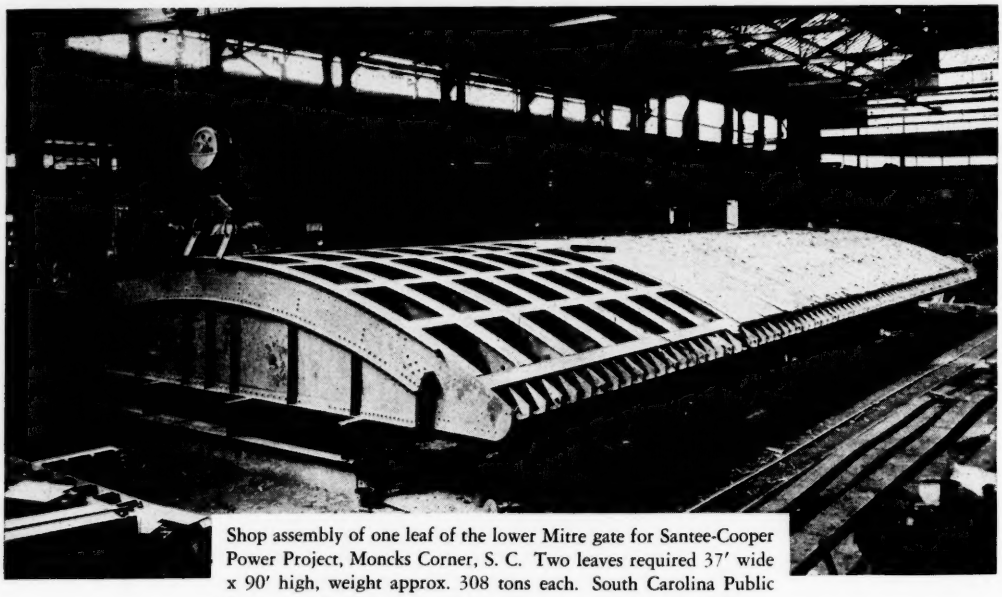
Write for Literature and Prices

70 Years Experience

Westinghouse . . . .
AIR BRAKE CO.
Industrial Division
PITTSBURGH, PA.

A 300-TON STEEL MITRE GATE LEAF ON TRIAL

But Experienced Workmanship assures the verdict



Shop assembly of one leaf of the lower Mitre gate for Santee-Cooper Power Project, Moncks Corner, S. C. Two leaves required 37′ wide x 90′ high, weight approx. 308 tons each. South Carolina Public Service Authority, owner. Harza Engr. Co., Chicago, Ill., Engrs.

When the two leaves of this huge mitre gate (37′ x 90′ each) are opened and closed 600-tons of steel must swing into motion. True alignment, perfect fit and free action are essential to this operation—which requires extreme accuracy in every drawing and manufacturing detail. A careful assembly in the shop is the preliminary "Try-out" to insure perfect fit and smooth performance on the job.

Various types of complicated construction requiring accurate workmanship and mechanical perfection is all in the day's work at Virginia Bridge plants. All types and sizes of gates for power development, waterway and flood control projects have been part of our regular production for many years. There is no substitute for experience on this class of construction.

VIRGINIA BRIDGE

STEEL STRUCTURES

VIRGINIA BRIDGE COMPANY

ROANOKE *BIRMINGHAM* *MEMPHIS*

NEW YORK *ATLANTA* *DALLAS*

UNITED STATES STEEL

LETTERS
« « « AND » » »
COMMENTS

"Observations on Unemployment"

Editor, MANUFACTURERS RECORD:

I have read and reread with a considerable interest the article "Observations on Unemployment" which appeared in your November issue and wholeheartedly agree with all the author has said. It seems to me, and I believe to upwards of twenty million others, that what business needs most is to have common sense substituted for government interference and one of the hardest things for me to understand is why The South, which is probably the greatest undeveloped asset of our Nation, would so overwhelmingly approve a third term for an administration which has ever been devastating rather than cooperative towards business.

The author of that article is to be commended for mincing no words, and it surely is worthy of your fine publication.

CHARLES H. GARLOW
Madison, Pennsylvania

* * *

Editor, MANUFACTURERS RECORD:

Upon receipt of the November MANUFACTURERS RECORD I read with considerable interest the Article on page 30 entitled "Observations on Unemployment." I certainly agree 100 per cent with the author of this article but would have made the statements stronger if I had written it.

I am farming today instead of being in business solely because of union conditions and labor laws which have taken away all reasons for a man to risk investments, or put forth efforts necessary to develop business.

For thirty years I was in business and besides being financially successful, I helped hundreds of young men to get a start in life—they were satisfied and happy in their work, as I was. But those days seem to be gone. When a man cannot work without government or union contract he is not *free,* and a man without freedom is in a truly awful condition.

Any man has the right to quit his job and strike for his rights, but no man, or law, has the right to tell another man that *he may not work.*

In my opinion we have, today, the most unjust situation ever known in America and we will never make any real progress until men are *free* to think and work individually.

One thing more. If the government can draft my boys for defense training at $30 per month, I contend that there should be a law to draft or control union labor wherever defense contracts are involved.

TYLER F. SNODGRASS
Snodgrass Farms
Elway, Virginia

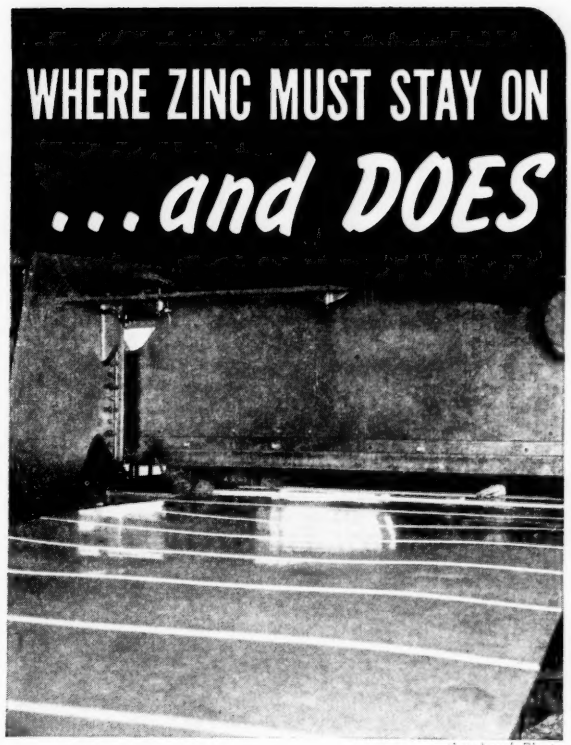
* * *

More About "The South's Resources"

Editor, MANUFACTURERS RECORD:

I would like to compliment you very much on this magazine. It is brimful of interest for any maufacturer. I think we are all interested in following closely the great development of industry in the South. You have presented it in a most intelligent fashion.

J. E. OTIS, JR., President
Dodge Manufacturing Corporation
Mishawaka, Indiana.



Trucking Photo

Down comes the brake on these ARMCO ZINCGRIP-PAINTGRIP sheets. There is no scoring, no flaking, no peeling of the galvanized metal. And out come sturdy roof panels for streamlined truck trailers.

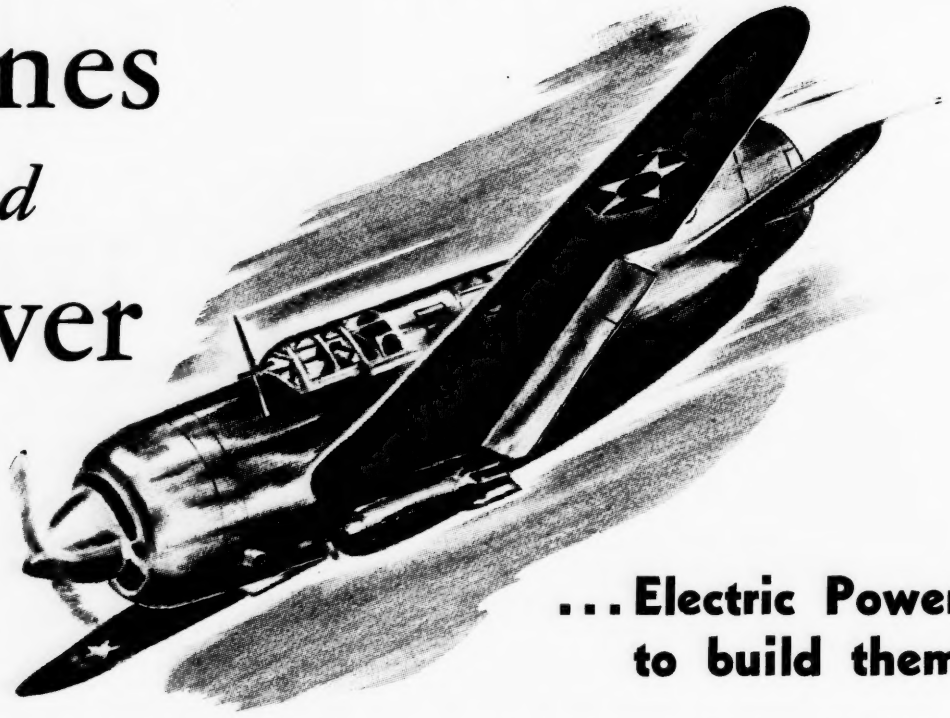
Next the bonderized surface of ARMCO ZINCGRIP-PAINTGRIP comes into play. This special mill finish permits immediate painting in any color. Shop costs go down and stay down. No need for etching; no loss of the protective zinc.

Once out of the shop, tops and bodies made of ARMCO ZINCGRIP-PAINTGRIP ring the bell to easier trailer sales and more satisfied customers. Protected by the tightly adherent ZINCGRIP coating, these roof panels really take the weather. Seams resist rust inside and out. Paint jobs look better, last longer.

Maybe your products and your sales will thrive on ARMCO ZINCGRIP-PAINTGRIP sheets. Why not talk it over with an experienced ARMCO man? Just write to The American Rolling Mill Company, 2531 Curtis, St., Middletown, Ohio.

ARMCO
ZINCGRIP-PAINTGRIP SHEETS

Planes *need* Power



. . . Electric Power to build them

COUNTLESS numbers of separate items are required to equip this country for vital defense. Vast quantities of electricity will be used to manufacture this equipment, speedily and in large quantities.

One item, the airplane, serves to illustrate: A single "Flying Fortress" contains 40 thousand pounds of aluminum. It takes 440 thousand kilowatt hours of electricity to make that aluminum . . . just 472 times as much electric energy as the average American home uses in an entire year. Electric power must also drive a multitude of machines to make our guns, our tanks, our shells . . . virtually everything our military and naval forces require . . . right down to the shoes and socks they wear.

• • •

Private initiative and experienced management have provided America with the electric power it now needs. Power is provided in the hundreds of industrial centers from which America's defense equipment will come.

That power is available because utility companies have continued to build up their reserves of generating capacity, year after year. Since it takes an average of two years to construct and equip electric plants, this preparedness by the utilities is helping the country in its present need.

As a result of a six-year expansion program, the companies in the Commonwealth & Southern group are well prepared to do their part in this national program. By 1941, we will have increased our already large generating capacity by about 30% over that of 1935.

This additional capacity, much of which is now available, means an increased output of more than two and one-half billion kilowatt hours of electricity annually under even normal operation. This output can be further increased by using generators longer hours.

• • •

For many years the Commonwealth & Southern group of companies has followed a consistent policy of reducing electric rates, both in the North and in the South. Today, our average home electric rate is less than 3 cents per kilowatt hour . . . *23% below the national average.*

For many years we have systematically extended our electric lines to farms and encouraged greater use of electricity in homes, commercial establishments and industrial plants.

As a result of these low rates and our cooperative merchandising of useful electric appliances, the average home served by Commonwealth & Southern companies is today enjoying the use of 1254 kilowatt hours of electricity per annum . . . *34% more than is being used in the average American home.*

Thus we have followed the historic American way of progressively giving consumers more for their money. This has enabled us to build up these production facilities which are now so essential to this Nation.

• • •

The operating companies in the Commonwealth & Southern group are located in five Northern states: Michigan, Illinois, Indiana, Ohio, Pennsylvania . . . and in five Southern states: Alabama, Georgia, Florida, Mississippi, South Carolina.

In these states are many highly industrialized centers which these companies serve. Such centers have now become doubly important to the Nation for the rapid production of defense armaments.

THE COMMONWEALTH & SOUTHERN CORPORATION

ALABAMA · FLORIDA · GEORGIA · ILLINOIS · INDIANA · MICHIGAN · MISSISSIPPI · OHIO · PENNSYLVANIA · SO. CAROLINA

The 1940

BLUE BOOK OF SOUTHERN PROGRESS

ready for distribution
December 15th

THE 1940 BLUE BOOK of Southern Progress will contain the latest available facts and figures on the South's industrial and agricultural output; it will augment the material published in "The South's Resources" issue which came out in September and will carry forward the comparisons made in each annual edition of the BLUE BOOK OF SOUTHERN PROGRESS during the last thirty years. As before, the 1940 BLUE BOOK will present the latest available statistics covering manufacturing, agriculture, mining and minerals, construction, power, transportation, and finance in each of the sixteen Southern states.

The 1940 *BLUE BOOK will contain comprehensive information about markets and reveal the outstanding industrial opportunities of the South and Southwest.*

Fifty cents a copy until December 15th
One dollar thereafter.

Published by

MANUFACTURERS RECORD

Baltimore, Maryland

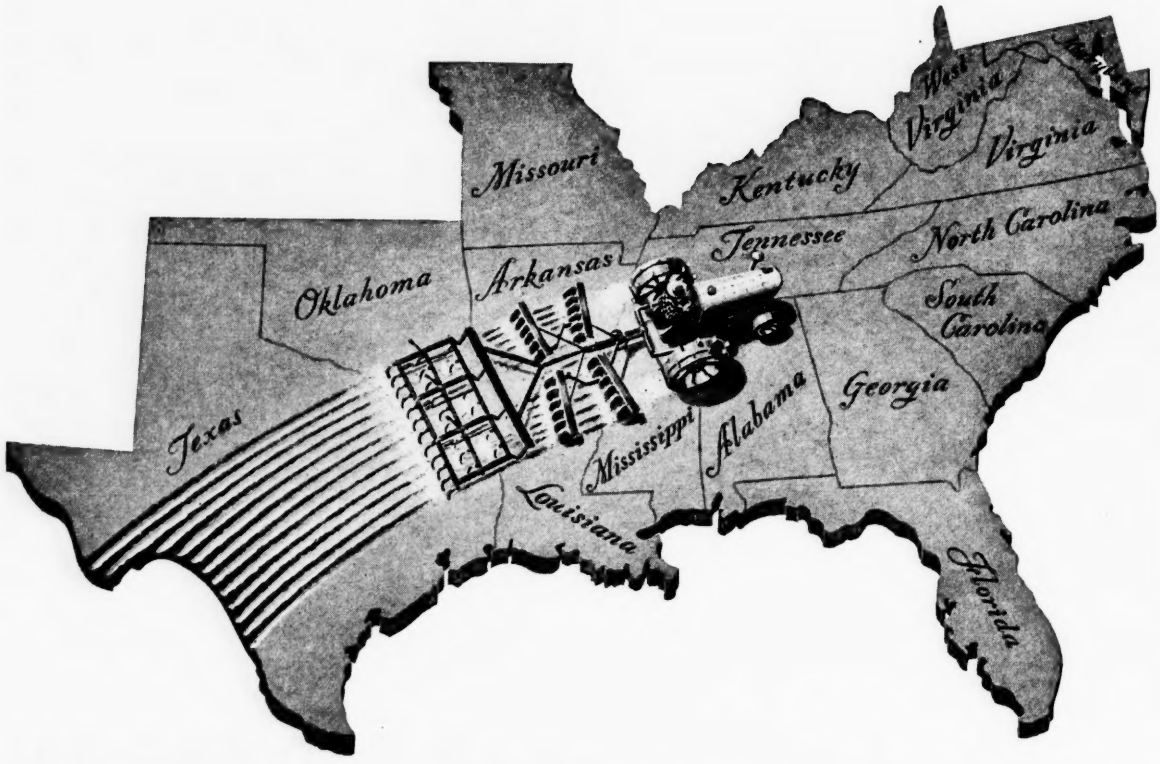
The Spirit of the Holiday Season

The true spirit of the Holiday Season—of Christmas and the New Year—is best expressed in humble gratitude for our blessings . . . in good will and the brotherhood of man . . . and a stronger faith in the ideals and institutions which have made our nation strong.

It is in this spirit that we express our gratitude for your friendship and patronage.

And it is in this spirit, that we wish for you a good old-fashioned Merry Christmas and a full measure of happiness, health and prosperity in the New Year.

Norfolk and Western Railway



120,000,000 Acres of Production

Tilling 120 million acres of Dixie's fertile soil is a major industry that runs into a billion dollars annually and supports more people than any other single industry. The South produces almost all of the United States' cotton, tobacco, sugar cane, sweet potato, peanut and rice crops as well as a substantial percentage of the nation's grain, fruit and livestock.

Southern farmers and planters have profited by the use of scientific methods and mechanized equipment. They have learned how to prevent soil erosion and fatigue, how to protect crops and livestock from spoilage and loss. As a result, the sixteen Southern States today account for almost half of the United States farm crop income.

And steel has helped them. It has given Southern agriculturists implements and machinery, better fencing, improved housing as well as adequate heating, lighting and power.

Bethlehem, with its sales offices, warehouses and many distributors, located from Texas to the Eastern Seaboard, is in position to supply the steel and steel products needed for the continued growth and maintenance of this basic Southern industry.

BETHLEHEM STEEL

BETHLEHEM STEEL COMPANY

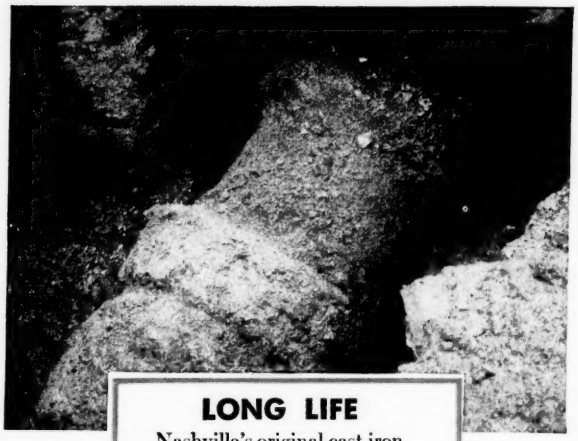
R.L. LAWRENCE, Jr.

(Superintendent and Chief Engineer, Water Works Department, Nashville, Tennessee)

writes:

"Although we have cast iron pipe in our system over 100 years of age, the only photographs available are of 24-inch pipe laid 59 years ago in the congested uptown section of the City. Several hundred feet of this line, which traversed the site of our new City-County Building, was recently removed and, being in excellent condition, will ultimately be placed back in service elsewhere. The maintenance cost per mile of this old line has been approximately $5.44 per year."

R. L. Lawrence Jr.

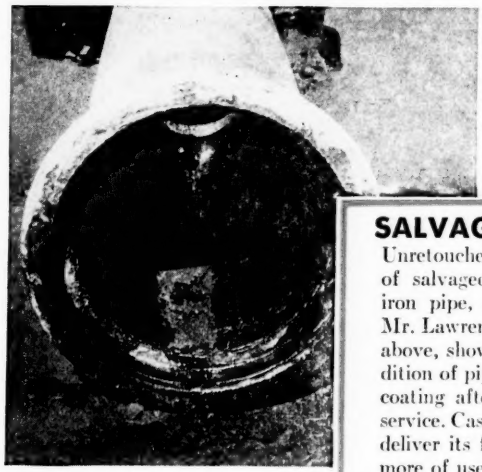


LONG LIFE

Nashville's original cast iron water main, still in service, was laid one year after New York's 109 year-old cast iron main, shown in the accompanying unretouched photograph. Many millions in tax dollars have been saved by the long life, low maintenance cost and salvage value of cast iron pipe.

LOW MAINTENANCE

is an economy feature of cast iron pipe that is proved by water works records the nation over. An impartial survey among 195 water works superintendents shows that the maintenance cost of cast iron pipe is far below that of any other pipe material which has been in use long enough for the recording of conclusive data.



SALVAGE VALUE

Unretouched photograph of salvaged 24-inch cast iron pipe, referred to in Mr. Lawrence's statement above, showing good condition of pipe and interior coating after 59 years of service. Cast iron pipe will deliver its full century or more of useful life, in one location or another, as changed conditions may require.

Water mains represent about one-third of this country's 5-billion-dollar investment in public water supply systems. More than 98% of these mains are cast iron pipe with a *known* useful life at least double the *estimated* life of other water main materials. Because the tax-saving, through avoiding replacements, is enormous, cast iron pipe is known as Public Tax Saver No. 1.

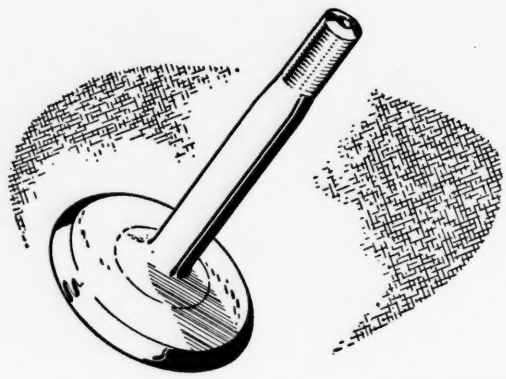
CAST Q IRON

Look for the "Q-Check" Registered trade mark. Cast iron pipe is made in diameters from 1¼ to 84 inches.

CAST IRON PIPE RESEARCH ASSOCIATION, THOMAS F. WOLFE, RESEARCH ENGINEER, 1015 PEOPLES GAS BUILDING, CHICAGO, ILLINOIS

CAST IRON PIPE

PUBLIC TAX SAVER NO. 1



PARADOX: HEAVY DUTY CALLED FOR LIGHTNESS

Big and *heavy* are like ham and eggs, or salt and pepper. Most of us think they belong together.

Not so.

Bigness often demands lightness.

A case in point: The biggest air-conditioning compressor we know of uses Aluminum valves in one of the heaviest-duty spots in the whole machine.

The reasons are pretty involved with the interaction of various forces, the way the valve springs behave, and so on. But the point is very clear—a light valve works better than a heavy one in exactly the spot where every slavish upholder of tradition would call for weight.

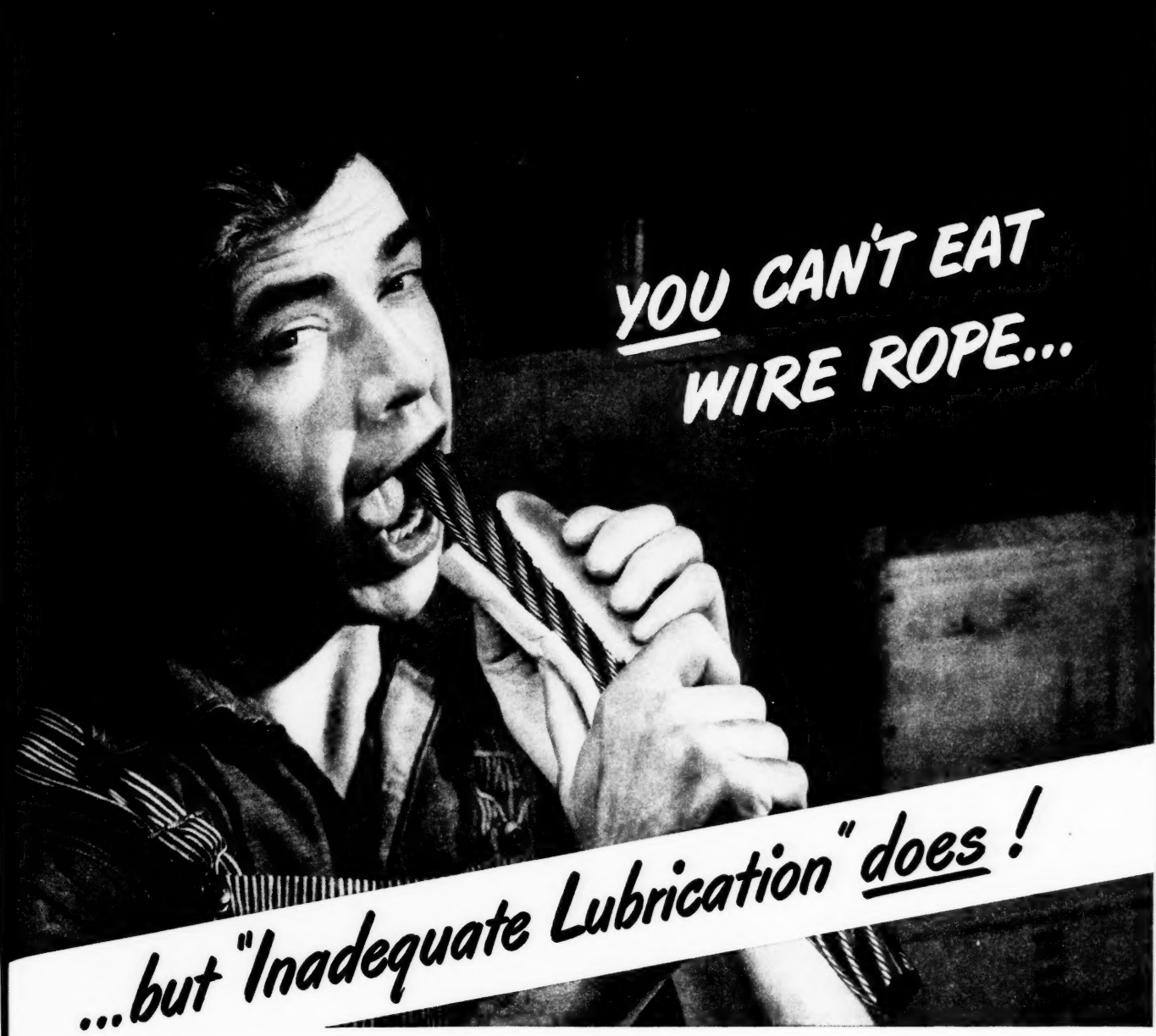
We make these valves for our customer from a strong alloy of Alcoa Aluminum by an ingenious process called impact extrusion. And, with all their advantages, they actually cost him less than the heavy, forged valves he used to use.

It often turns out that way when you adopt the principle of lightness via the strong alloys of Alcoa Aluminum.

Such are the things Alcoa Aluminum is doing to traditional ideas of weight. Needless weight has no business in business. It is never expensive to use Aluminum wisely. Aluminum Company of America, 2109 Gulf Building, Pittsburgh, Pennsylvania.

ALCOA

ALCOA · ALUMINUM



Perhaps you never thought of lubrication in just this way — but picture to yourself thousands of tiny "bearings" sliding and pressing against each other. Naturally, they must be lubricated — and naturally you'll see that they are lubricated in your wire ropes — when you realize what it means in dollars and cents.

A proper wire rope lubricant regularly applied to the rope on the job, forms a protective coating that keeps those thousands of "bearings" operating with minimum friction. The result: — Wire fatigue and corrosion checked; more uniform wear; longer rope life.

Be sure your lubricant is the *right* one, that you are applying it properly and with sufficient frequency.

JOHN A. ROEBLING'S SONS CO.
Trenton, N. J. *Branches in Principal Cities*

ROEBLING
JAR Wire Rope

CORRECT LUBRICATION:

1. *Reduces Rope Wear*
2. *Prevents Corrosion*
3. *Prolongs Rope Life*
4. *Lowers Operating Cost*
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This advertisement is published in the interest of all wire rope users to help them obtain greater safety, service and efficiency from their wire rope.

Ask about ROEBLING "BLUE CENTER" WIRE ROPE *either preformed or standard*

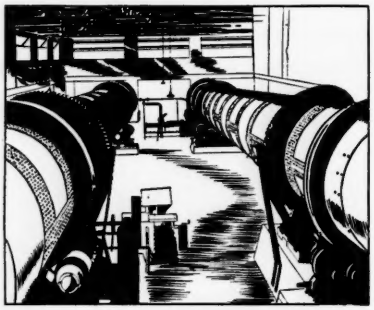
. . . to Industrial Opportunities Galore in the Gulf South

● There's work to be done in the Gulf South, land of industrial opportunity. There are growing local and Pan-American markets to be supplied—abundant raw materials to be utilized.

Clean, fast, dependable Natural Gas efficiently meets the fuel requirements of modern industry and complements other Gulf South advantages such as complete facilities for shipping and travel by rail, water, highway and air—ideal living conditions in a mild year-round climate—native, white, reliable, intelligent labor—ample power—plentiful land—good schools.

Industry is decentralizing southward to a friendlier atmosphere. Move to the Gulf South where you are wanted and appreciated by your neighbors.

This Company's industrial and engineering facilities are available to industries interested in Gulf South opportunities. Without obligation let us make a confidential survey for you to meet the requirements of your industry.



Abundant, dependable Natural Gas serves as fuel in this lime kiln in a Gulf South paper mill.

For information on GULF SOUTH opportunities write to
SUPERVISOR OF INDUSTRIAL DEVELOPMENT

UNITED GAS
PIPE LINE COMPANY

FOR TEXAS, *Mail received at:* Beaumont, Beeville, Dallas, Fort Worth, Houston, Longview, San Antonio and Wichita Falls. **FOR LOUISIANA,** *Mail received at:* Baton Rouge, Lake Charles, Monroe and Shreveport. **FOR MISSISSIPPI, FLORIDA and ALABAMA,** *Mail received at:* Jackson, Mississippi.

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COPR., 1940 UNITED GAS PIPE LINE CO.

Call Scully

AND RELAX!

"An order was received at noon Saturday," says our Newark Warehouse, "with request to deliver in Corning, N.Y., not later than Tuesday morning. It was for large C. B. Sections and was immediately shipped by railroad. It was at customer's siding in Corning on Monday morning before the plant opened. The customer was enthusiastic about the way his order was handled."

YOU can rely upon Scully to handle your orders promptly, accurately and cheerfully . . . whether large or small, regular or rush. So whenever you need steel or steel products, copper or brass, put it up to Scully and know that you'll get prompt action. Thousands of customers have learned that Scully Service is the same at each of our eight conveniently located warehouses. They all operate on the principle that our customers want immediate service and friendly contacts — and they always hurry whether you ask it or not. And when you say "Rush" they know you mean it.

Why not try Scully Service? Phone, write or wire the warehouse nearest you. And ask for our complete and handy Stock List and Reference Book. It's free.

Scully Service

The Mark of Service

ALLOYS
ANGLES, HOT ROLLED and COLD ROLLED
ARCHES (CORRUGATED)
BABBITT
BANDS and HOOPS
BARS, HOT ROLLED
  ALLOYS (HR and CF)
  COLD FINISHED
  ELECTRIC HIGH CARBON STEEL
  REINFORCING
BEAMS and C. B. SECTIONS
BEEF RAIL
BOLTS, NUTS, WASHERS, ALL KINDS
BORING and TURNING BARS and GRINDERS
BRACES, BOILER
CHAIN, ALL KINDS
CHANNELS
CHISELS
CHUCKS, STAYBOLT
CLAMPS, BOILERMAKERS
CLIPS, PATTERSON
CLEANERS, FLUE
CONDUCTOR PIPE
COPPER and BRASS
COUPLINGS, HOSE
CRAYONS, SOAPSTONE
CUTTERS
DARDELET RIVET and MACHINE BOLTS
DRILL RODS
EAVE TROUGH and FITTINGS
EXPANDERS, FLUE
FERRULES, COPPER
FLANGES, BOILER and TANK
FLOOR PLATES
GALVANIZED SHEETS, BARS, BANDS
HANDLES, HAMMER
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HOISTS, HAND and POWER
IRON, STAYBOLT
LUGS, BOILER, TANK and SILO
MACHINERY, HAND and POWER
MANHEAD PLATES and FITTINGS
NAILS
PACKING
PAINT STICKS
PLATE STEEL, STANDARD QUALITIES
  ABRASION RESISTING
  COR-TEN and MAN-TEN
PLUGS, FLUE
RAILS and FITTINGS
REAMERS
SHAFTING
SHEETS
  ABRASION RESISTING
  ELECTRICAL
  COR-TEN and MAN-TEN
  HOT ROLLED and UNIFORM BLUE
  WELLSVILLE POLISHED
  COLD ROLLED
  STAINLESS STEEL
  GALVANIZED and GALVANNEALED
  LONG TERNE
  CORRUGATED
  U-S-S COPPER STEEL
SPRING STEEL BARS and SHEETS
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TEES
TIRE, ROUND EDGE
TOOLS, HAND and POWER for BOILER and IRON WORK
TROLLEYS
TUBES, BOILER
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VALVES, BLOW-OFF
WELDING ROD and WELDERS
ZEES

The Mark of Quality

USS

We have big stocks on hand **NOW . . . for immediate delivery**

SCULLY STEEL PRODUCTS COMPANY

Distributors of Steel, Steel Products, Copper and Brass

Warehouses at **CHICAGO · NEWARK, N. J. · ST. LOUIS · BOSTON**
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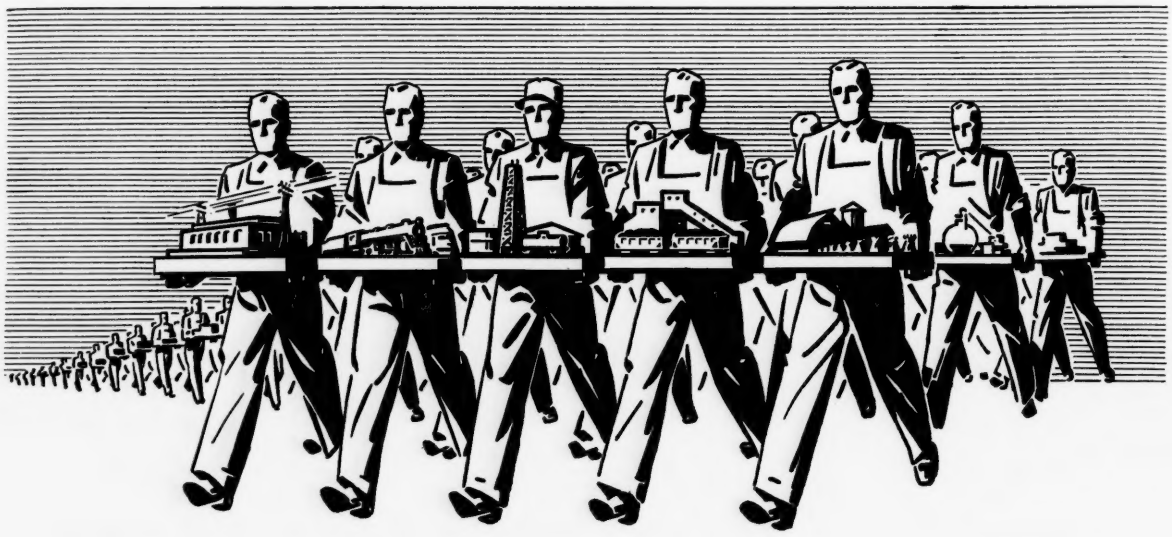
UNITED STATES STEEL



THE MINUTE YOU LOCATE IN ILLINOIS

These Profit Producers Go to Work for You

LIKE an army of unseen workmen, the outstanding industrial advantages of Illinois work day and night, year in and year out, to add to the prosperity of manufacturers who are located in Illinois. It is this exceptional *combination* of production, distribution, and marketing advantages which make Illinois the logical location for new plants and branch plants in so many industries. Check these advantages which you will gain by locating in Illinois:

FINE LABOR SUPPLY—Intelligent, skilled, and cooperative labor serves Illinois industry. RAW MATERIALS—Agricultural, mineral, and other vital materials for industry are available. MARKETS—Direct connections with National markets and overnight shipping service to the entire Middle West market. TRANSPORTATION—Direct rail, highway, water, and air transportation to every part of the Nation and to Central and South America. FUEL—Illinois is the third producing State in both oil and bituminous coal. WATER—Abundant water, supplied by eight great drainage basins. POWER—Facilities ample for today's needs and geared to tomorrow's requirements. EQUIPMENT—The second largest metal-working State, assuring adequate supplies of machines, parts, and tools. PLANT SITES—Ample room for new plants and expansion in every section of the State. TAXES—Illinois has NO State Income Tax, NO State Real Estate Tax, NO State Machinery Tax.

Special Confidential Report to Executives

Write the Illinois Development Council, at Springfield, for full data on the Industrial Advantages of Illinois. Please describe the nature of your business and list any special or unusual requirements in labor, raw materials, plant facilities, or any other production or distribution factor, in order that a truly practical and informative report may be submitted for your consideration. Your inquiry will, of course, be kept confidential. Write—

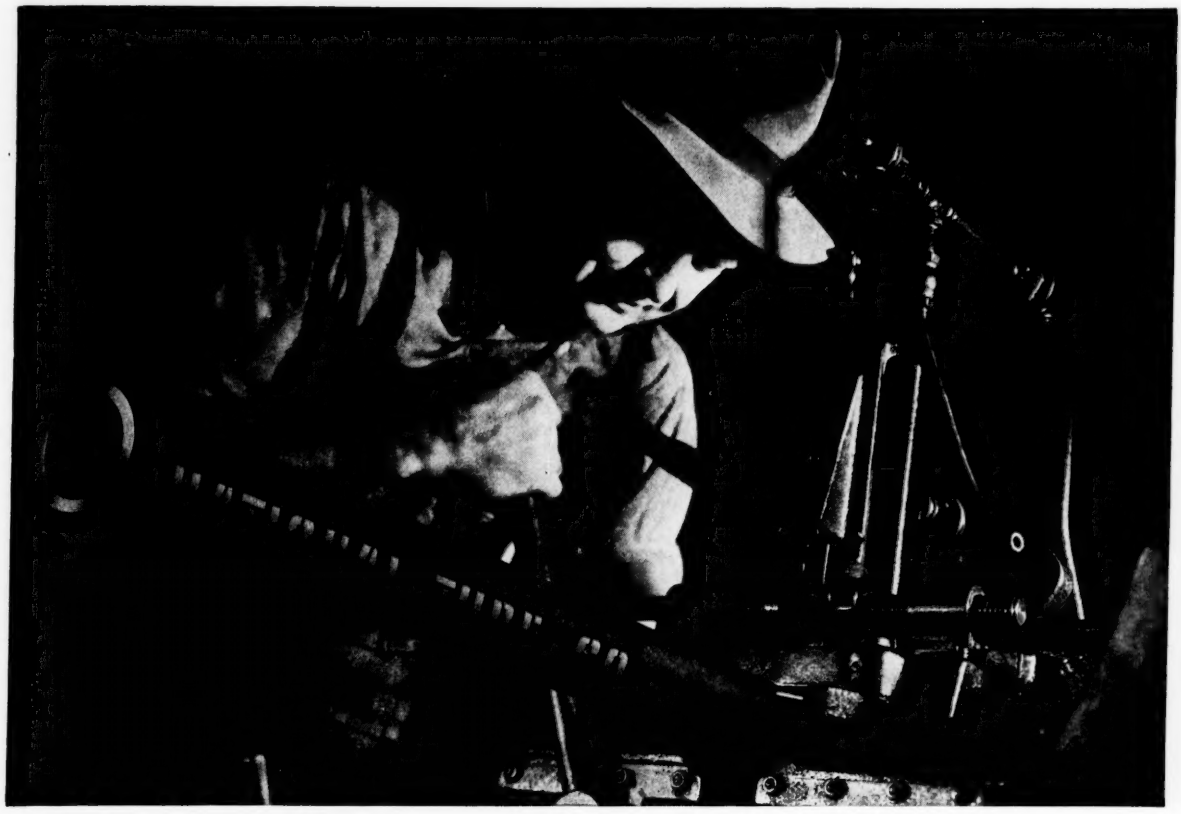
ILLINOIS DEVELOPMENT COUNCIL • STATE HOUSE • SPRINGFIELD, ILLINOIS

ILLINOIS

THE STATE OF BALANCED ADVANTAGES

FOR 50 YEARS THE LEADING

STEEL PIPE



• LEADING *in value*
• LEADING *in usefulness*
• LEADING *in sales*

FIFTY years ago, steel pipe began its phenomenal growth. Many builders and industrial engineers soon found that this "new kind of pipe" was what they wanted — strong, durable, and low in cost. It proved so practical for so many applications that it moved to leadership in the following years.

Today finds steel pipe still setting the pace—still ahead of the field—the world's largest-selling pipe—the most practical to use in the vast majority of applications.

During all these years, to satisfy the changing needs of industry, NATIONAL Pipe, though still fundamentally the same strong steel pipe of fifty years ago, has been constantly improved. NATIONAL Pipe today is cleaner, stronger, more uniform, easier to work. Higher quality steels, processes for removal of scale, methods of retarding corrosion — all have contributed to give the greatest value per dollar of cost.

Distributors, located in strategic parts of the country, are at your service.

NATIONAL TUBE COMPANY

PITTSBURGH, PA.

Columbia Steel Company, San Francisco, *Pacific Coast Distributors* · United States Steel Export Company, New York

UNITED STATES STEEL

CARBORUNDUM *Congratulates* RUSTLESS IRON AND STEEL CORPORATION

● Down in Baltimore they have made an already great plant greater. Rustless Iron and Steel Corporation has just completed and opened an impressive addition to increase its production facilities.

This is important and welcome news because it means, of course, the expansion of an important industry famed as producers of stainless steel products.

In extending our congratulations we take a pardonable pride in pointing out that grinding wheels by Carborundum are used exclusively on the battery of Cincinnati Centerless Grinders in this plant.

These wheels are being used on all production work, starting with the first or rough grinding passes and continuing right on to the production of the highly finished bar stock of all grades of stainless steel.

Once again it has been a case of providing the right wheel in the right place . . . of conscientious engineering service to the end that these wheels have become necessary and vital factors in maintaining high quality standards and high production records, and in linking the name "Carborundum" with that of "Rustless".

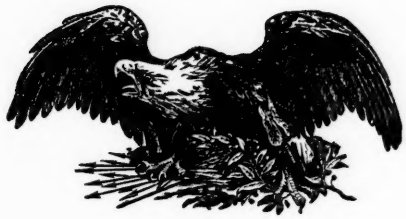
CARBORUNDUM
ABRASIVE PRODUCTS

THE CARBORUNDUM COMPANY
REG. U. S. PAT. OFF.

Niagara Falls, N. Y.

Sales Offices and Warehouses in New York, Chicago, Philadelphia, Detroit, Cleveland, Boston, Pittsburgh, Cincinnati, Grand Rapids

(Carborundum is a registered trade-mark of and indicates manufacture by The Carborundum Company)



As Industry Sees The South

In the November edition of the MANUFACTURERS RECORD, the views of leading business men were expressed about the South as a field for development and its growing importance as a market. They are followed by other articles in this number from prominent firms who are proving their faith in the South by large plant investments.

That the South is facing a future of great promise no one aware of the facts can doubt. Men who are investing large sums of money in new ventures for their stockholders do not proceed in a haphazard way, but act only after obtaining the most expert advice on every phase of the particular needs of their business. They must know that the ground water supply necessary for their plant operation is ample; that the raw materials needed for their products are close by and in sufficient quantity. Labor supply and educational facilities for their workers' children are examined, besides the laws of the states as applied to corporations, together with taxes which may be an inducement or the reverse.

All of these things have their place in bringing about the utilization of the wealth nature has given the South in forest and mine and soil. Thus the chemical industry is finding the Southern states the ideal location for the vast enterprises that are contributing so much to human welfare. It is because of the expanding consumers market found in the South that the great United States Steel Corporation finds it advisable to make a further investment of $30,000,000 in plant expansion as recently announced. Irving S. Olds, Chairman of the Board of the Steel Corporation, said in a letter to the MANUFACTURERS RECORD—"Our opinion of the South as a manufacturing region and as an important market is best expressed by the announcement of last week to the effect that Tennessee Coal, Iron and Railroad Company is increasing substantially its steel-making and finishing facilities at Birmingham. It seems to me that this announcement speaks more eloquently on the subject than anything which I could say along the lines you outline."

There is a responsibility resting upon public officials and lawmakers to encourage a development that extends from the Mason and Dixon line to the far reaches of the great Southwest. It is easily demonstrated that by proper encouragement private capital will invest, industry will expand, labor will be employed and new wealth created. The story appears on another page of a great Southern shipping enterprise with 30 vessels plying the seas, carrying freight to and from gulf ports. In addition, 18 new ships have been contracted for and of these, nine are already launched. Twenty-five hundred men are employed as their crews; nearly all American citizens; and the American flag is flown from every one of these ships carrying American commerce from Southern ports into all parts of the world open to traffic.

In the South are new frontiers awaiting those who seek them.

A Few Thoughts

The European war has dislocated the peace time pursuits of vast populations. Whether the conflict goes on for years, or ends soon, conditions that will follow the laying down of arms are a matter of great concern to the whole world, and especially to the United States economically because of the importance of this country as a consuming market.

The nations engaged in the struggle have been largely exporters to other lands. They buy their raw materials and send out manufactured products. With a depleted currency, their gold supply almost at a vanishing point, and credit at a low ebb, their problem is bound to be a serious one. We might as well face the fact that in the readjustment process a major effort will be made to find in America a market for goods produced by cheap labor, which will compete with the products of this country.

Also at that time many thousands of our own people employed in war industries and in the service will be looking for new jobs, so that it is manifest our own affairs will claim attention of the best minds we have.

The aftermath of the last war is not likely to be soon forgotten. Plant expansion necessary for the war effort will leave idle plants when peace comes. For the government finally to own plants for which it is now advancing the money does not answer the question, nor is it easy to see how men will find jobs when our factories are brought face to face with the competition described. The defense program, however, is a necessity, and if we have to charge all of it off, the energy of America will be directed as should be toward its completion.

Wise men plan to meet conditions likely to arise before they are actually confronted with them, and in view of the fact that defense will undoubtedly call for many more billions than have been so far appropriated, unnecessary expenditures that have accomplished so little should be stopped forthwith. The President said recently that the whole subject of expense will be explored to ascertain what savings may be effected, and there is no promise more encouraging to business which is ready through every resource to put private enterprise into the effort of making our defense complete. In the meantime, however, it is wise to husband our resources for the inevitable day of settlement that must come. At that time we will be in a new state of affairs, and the country may face severe sacrifices not now contemplated. It will be well to be prepared for them.

The constant cry of labor for shorter hours and millions outstretching their hands for governmental gratuities are not the sort of things that tend to the strengthening of character. Perhaps in the mysterious ways of Providence a refining process may come about. Many men now living remember when twelve hours work a day were not regarded as unhealthy and Saturday half holidays were unknown. Also, then it was the individual's responsibility to progress in the world, and if unwilling to face self-denial it was a pretty sure sign that success would not mark his career. It used to be said that three generations were the period from shirt sleeves to shirt sleeves, and maybe that will not be altogether undesirable.

Young men of today will have most of the burden of the future. Will they be prepared to endure the sacrifices and demonstrate the elemental traits of character so essential in the upbuilding of the nation? No mass movement, no youth administration, no labor unions, no government, can build individual success, and it is well to have in mind that this country has advanced through the efforts of the individual. A paternalistic government, unfortunately, in recent years has fostered dependence upon government aid, overlooking the fact that it is the duty of citizenship to support government and the reverse inevitably leads to bitter consequences.

To face what may come, and no man can tell what this may be while there is such confusion throughout the world, it would seem to be a time to start on a course different from that which theorists have injected into governmental procedure in recent years, and which we fear has been too prevalent in our homes and schools. Strong individual character is likely to be needed as never before. It is well to remember that as England fights for her life we are the last bulwark remaining as the hope of mankind.

South Provides Large Part Of Lumber In Defense Program

Lumber requirements for the present national defense program are being met on schedule and demands on that industry have now passed their peak, it was announced recently by Edward R. Stettinius, Jr., member of the National Defense Advisory Commission in charge of Industrial Materials.

A two week survey of the industry shows that

production for the current year will exceed last year's output by substantially more than the amount required by defense. Despite the large sudden demand placed on the mills by government orders for lumber required in the construction of cantonments, mills have been able to meet delivery schedules without causing a delay in construction work.

This is demonstrated by the fact that construction work is now ahead of schedule and 90% of the buildings required to house 1,000,000 men will be completed by January 1.

The recently-completed survey shows that increased production in the lumber industry has been particularly noticeable in the South, where many mills are working overtime and numerous small new units have been put into operation. The South this year will produce approximately 8,000,000,000 feet of lumber, the survey showed, while Oregon and Washington will produce 7,500,000,000 feet and the Western Pine Region will turn out more than 5,000,000,000 feet.

Total production for the industry during the current year will approximate 28,500,000,000 feet, compared with 25,000,000,000 feet last year.

Lumber requirements directly resulting from the present defense program are estimated at one and one-half billion feet. Practically all of this material already has been purchased. The defense housing program, it is estimated, will use approximately one billion feet of additional lumber during 1941.

The Story Of Sulphur

As readers of these columns are aware, the theme upon which the MANUFACTURERS RECORD dwells most frequently is that of the South's resources and their development. It is a compellingly interesting theme, dealing as it does with the creative work of private enterprise.

Perhaps forty years ago a new invention was described in the MANUFACTURERS RECORD — the Frasch hot water process for melting sulphur and abstracting it in liquid form, which made this country free of its dependence for supplies upon Italy and Spain. Since that time Louisiana and Texas have been furnishing the country's needs in sulphur, and a vast enterprise has developed with ramifications that bring it into contact with very many of the producing industries of America in other lines. The story is brought up to date in an interesting article in this issue—"Sulphur and the South," by J. T. Claiborne, Jr., Vice President of the Freeport Sulphur Company, who rightly says:

> "The industrialization of the South in recent years has been one of the notable national trends. This movement is, however, but the sum of a great many individual decisions reached by companies and industries. In planning their expansions and penetrating new markets, they have weighed carefully the availability of indispensable raw materials. Because sulphur serves in this relationship to such a wide range of industries, no small credit can be paid this basic mineral for the location in the South of the growing number of new plants which are creating employment throughout the region."

The article refers to the wide sweep of development in many lines going forward in all of the Southern states and pictures what has taken place since the beginning of the century.

Man-hours For Defense Work

Alfred P. Sloan, Jr., Chairman of General Motors Corporation, asks for a return to a 6-day work week and elimination of the overtime penalty to speed the production of industry "if the defense program takes up the existing slack of unemployment."

There appeared in these columns last month under the heading of "Labor and Industry in War" a discussion of Germany's method of securing production. It was estimated that the Axis powers of Germany and Italy in preparing for war had at their command a total of 3.6 billion man-hours a week, and that as the labor supplies in the various conquered countries were absorbed this figure might be raised to 4.8 billion man-hours a week.

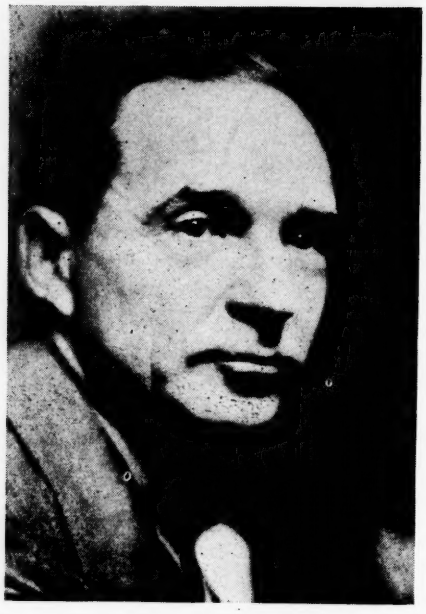
The United States, on the other hand, has a total of approximately 2.2 billion man-hours of work a week, which would be raised to 2.6 billion man-hours if the unemployed were obsorbed and the labor supply reached the customary wartime proportion of fifty per cent of the population. The estimate was based on the assumption that the labor force in the Axis countries works 60 hours per week, and workers in this country were employed 40 hours per week.

The deduction was arrived at that "if we are to compete successfully with the Axis powers in the manufacture of war materials, we must rely more and more on our superior mechanical production." To what extent more labor can be employed until machine capacity is increased may be a question, but in such defense plants as are not working 24 hours a day it would seem that Mr. Sloan's suggestion may well be applied.

William Green, President of the American Federation of Labor, says that under the defense program labor wishes to prevent interruption of production for any reason, and suggests tribunals to be set up to adjust differences. This is an admirable thought and another one is alien influences responsible for tie-ups in important defense industries should be promptly removed from Labor Unions and sent out of the country.

South's Advantages *Recognized*

The Increasing Industrial Importance of the South



by
EDSEL FORD, *President*
Ford Motor Company

The automotive industry, like many others, realizes well the increasing industrial importance of the South. The Ford Motor Company is naturally grateful for having shared in this industrial development.

Besides the 7000 direct employees in our Southern branches located at Alexandria, Atlanta, Charlotte, Dallas, Houston, Jacksonville, Louisville, Memphis, New Orleans, Norfolk and Oklahoma City, there are many thousand others engaged in the production and processing of materials for our use.

Of the agricultural products produced chiefly in the South, we use in a million car year:

Cotton—89,700,000 pounds in upholstery, tires, brake lining, timing gears, artificial leather, lacquer, safety glass, battery boxes, paper products, upholstery fabrics and plastic parts.

Tung Oil—728,000 gallons in enamel and varnish, top material and brake lining.

Southern Pine Products—1,631,000 pounds in foundry bonding material, paints and lacquers, adhesives, gums and bonding material in hard panel board. Also 2,350,000 pounds of special panel board.

Sugar Cane—The alcohol obtained from 2,500,000 gallons of molasses. Also 2,320,000 pounds of insulating board.

Our direct purchase of materials from concerns located in the South in 1939 was approximately $14,000,000.00.

At Ways, Georgia, we now have over 1,000 acres in cultivation where many problems are being studied in connection with the further use of agricultural products in industry. Among the most important we would mention are starch from various sources, soybeans, plastics from southern products, tung, perilla, castor and other oil, as well as many other miscellaneous crops.

It is our belief that the South will continue to grow

The growth of the South in recent years as a source of raw materials, as a manufacturing region and as an important market has attracted nation wide attention and more than once has been described as phenomenal. However, the question persists as to just how important this region is in the opinion of particular industries.

In order to find this out, the MANUFACTURERS RECORD *invited a number of executives to express themselves.*

Last month was published the first of these statements and others follow here.

Among those to whom we wrote was Mr. Irving S. Olds, Chairman of the Board of the United States Steel Corporation. Instead of sending a formal reply Mr. Olds answered by letter as indicated below. The expansion at Birmingham of United States Steel's subsidiary, the Tennessee Coal, Iron and Railroad Company, which Mr. Olds mentions, is referred to more fully on page —. EDITOR.

by
IRVING S. OLDS, *Chairman*
Board of Directors
United States Steel Corporation

Our opinion of the South as a manufacturing region and as an important market is best expressed by the recent announcement to the effect that Tennessee Coal, Iron & Railroad Company is increasing substantially its steel-making and finishing facilities at Birmingham. It seems to me that this announcement speaks more eloquently on the subject than anything which I could say along the lines you outline.

—*by leading industrialists*

in industrial importance and that this will be influenced by continual improvement in means of transportation, the further development of Southern farm products for industrial use, and further decentralization of industry.

We are all familiar with the influence of the automobile and truck on the building of better roads. Also the reduction in costs of transportation that have been made possible by the improvements in these vehicles of transportation. Further improvements along these lines will certainly extend the market for Southern materials and products.

Regarding the increased industrial use of Southern farm and forest products, we believe that steady expansion may be brought about by research and experimentation. The fairly recent examples of the growing use of Southern tung oil, Southern castor oil and Southern soft woods point the way to what we may expect along these lines.

Possibly a factor having great influence on this expansion will be the decentralization of industry where practical. By careful consideration of the various questions entering into the feasibility of this decentralization such as source of raw material, its bulk and weight, yield obtained in manufacture, disposal of the residue, comparative power costs, type of labor available and many other questions, we believe more decentralization will be possible and practical.

The Ford Motor Company in its 18 small rural manufacturing plants has already proven the advantages to be gained by both industry and the rural communities by intelligent decentralization of industry. These small plants show how the gap between farm and factory can be lessened and the two made interdependent to the advantage of both.

These small plants now employ more than 2000 people, who live in the surrounding territory. Equipped with the newest, most modern machinery, they make Ford parts and tools. All of them receive at least $6.00 for the 8 hour day and 5 day week. In their spare time, and on off days, many of them operate small farms or garden plots. The people who work in these small plants have one foot on the land and one in industry and are relatively safe from the ills of the fat and lean periods of industry. Then, too, the ideal working conditions afforded by these small plants, and the pleasant living conditions in village and farm, both make for contentment.

It is our sincere hope that by these above means and others the industrial development of the South may continue to grow and that we may be helpful in this accomplishment.

Buying Power in the South Has Increased Rapidly

by
MELVIN H. BAKER, *President,*
National Gypsum Company

At the present time the National Gypsum Company has four major operations in the South located at Orando, Virginia, Savannah, Georgia, Mobile, Alabama, and Rotan, Texas.

These plants and the reasons for their establishment clearly indicate our belief in the South.

Before building our insulation board plant at Mobile a comprehensive survey was made covering ten different locations. We finally selected Mobile, primarily because of the unlimited supply of second growth pine available nearby. At the Mobile plant we grind into shredded wood about 100,000 tons of this pine per year, where it becomes the basic material out of which we manufacture insulation board at that plant.

Before building our gypsum mill at Savannah we first appraised the market for use of gypsum through the Southeast and then selected Savannah as a central location where gypsum could be brought in in cargo lots from our deposits in Nova Scotia, delivered at low cost and finally the finished product delivered into the market with a minimum cost for transportation.

The items of power and labor are important in the

South's Advantages *Recognized*

manufacture of gypsum. We found at Savannah very favorable power costs. There was available ample labor and it was less contaminated with the so-called "foreign element" and, therefore, a desirable class of labor.

At Oranda, Virginia, we have a lime mill located on one of the finest stratas of limestone in the country. In addition to this being high grade stone, it can be taken out at low cost. From this point we are able to ship into a large market with comparatively low freight rates. Because of the high quality lime that comes from this deposit we are able to ship it to many locations both North and South at a premium in price.

Our new gypsum plant at Rotan, Texas, is located on a very large deposit of gypsum. This is the only section in the country where there is available for the same operation both gypsite and gypsum in rock form. The raw material there permits of flexible operation and the manufacture of a very complete line to include everything made of gypsum. But more important is the fact that the gypsum can be taken out of the ground at low cost—lower than any place in the United States. Hence, we have our lowest cost gypsum operation in this plant. Here again because of low operating cost we can ship the finished product into a wide field and compete favorably.

It has been our experience that buying power in the South has increased rather rapidly. Other industrial operations have undoubtedly located in the South for economic reasons similar to our own. This has increased payrolls and, consequently, given the South a much larger purchasing power. Here again from our own standpoint we find a growing need for better housing and more construction of every type where our products will be used. As this demand continues to grow we anticipate a need in our business for additional capacities to be located in the southern market.

Generally speaking, we have been impressed with the low cost electric power and the tremendous opportunity for water transportation, each of which is vital to our type of manufacturing. There is, however, another element quite important and that is labor. A better class of labor is available in the larger centers through the South. It is free from "isms" and there exists a better sense of loyalty than in most industrial sections.

Southern Management Alert to Grasp Opportunity

From my own observation during the past ten years I can testify to the accuracy of existing figures ordinarily used as proof of the South's development. Data such as the 1940 census which indicates a 9.3 percent in-

by
J. P. LAWRENCE, *Vice-President*
American MonoRail Company

crease of population in Southern states as against 5.1 percent for the remaining states, is often hard to believe unless you actually see its results and can determine the cause.

On every one of my trips during this period I have been impressed by the number of new plants established and particularly by the wide diversification of industry which they represent. Hence when I read that between 1931 and 1937, while 10,106 factories elsewhere were closing down, 1,575 new ones were opened in the South, I know it is true for I visited many of them in that time.

That this trend continues is indicated in a definite manner by recent figures showing an increase of 49 percent in electric power output in the South against 33 percent in other states.

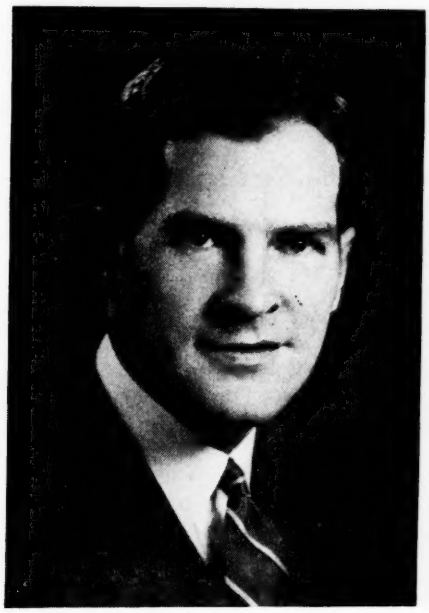
I like to attribute this, and base my entire confidence in the future of the South, upon the type of management responsible for its development. Personal contact proves to me that in most cases these men look with clear eyes at new production methods. They seem eager to install modern cost saving equipment wherever it applies.

These facts, together with the cumulative effect of increasing vocational opportunities and the tremendous

(*Continued on page* 64)

—*by leading industrialists* (*continued*)

The South—from the Meat Packer's Viewpoint



by
EDWARD FOSS WILSON, *President*
Wilson & Co., Chicago

The South is growing rapidly—not only as producer of livestock but also as a consumer of livestock products. Preliminary figures now being released from the 1940 census show very clearly what national distributors have known for many years—that the South is becoming an increasingly important part of the national economic structure. With the exception of the West Coast, no other region has shown the over-all gains in population that the states which make up the South have enjoyed. While the United States as a whole was increasing but seven percent during the last decade, and the states other than in the South gained only six percent, an increase of more than nine percent was registered in the South. In terms of rate of gain, it is clear from the above that during the past ten years the South has grown 50 percent faster than the rest of the United States. Gains in the individual Southern states range as high as 28 percent—in Florida.

But the South's chief gain has not been merely in population—what is more significant, the buying power has been boosted by a variety of factors. This has been achieved despite the reduced income from cotton raising. Not only has southern farm income been substantially supplemented by industrial payrolls, but the total value of the South's industrial output is now several times the Southern farm income. Climatic and labor advantages plus economic sources of raw material, too well-known to deserve more than mention here, have been the important incentives responsible for industry's march to the South.

That the South's present industrial picture is by no means static but actually presents indisputable evidence of being sharply on the upgrade, is of definite interest to any concern doing business on a national scale. For relatively recent industrial acquisitions, such as the several large paper mills and the success of southern chemical plants, point the way to more and larger plant installations, from which larger payrolls will subsequently boost consumer buying power yet further. So well entrenched is the South in the cotton, rayon, furniture and petroleum industries that we now take its leadership in these fields for granted, yet it is reasonable to anticipate further growth along these and allied lines.

On the producing side of the livestock picture, the South presents equally striking evidence of growth. For instance, numbers of cattle and calves in the South Atlantic states increased 24 percent in the ten years ending Jan. 1, 1940; in the South Central states the increase was 16 percent; while in the rest of the United States the increase was but 11 percent. Slightly more than 30 percent of the entire cattle and calf population of the United States is now contained in the South Atlantic and South Central states combined.

In hog production the increase has been even more substantial than in the cattle industry. The South Atlantic states gained 27 percent in hog numbers in the last ten years, while the South Central states registered a full 44 percent gain. These gains were accomplished while the hog numbers in the rest of the United States actually decreased four percent. Together these Southern areas as of January 1, 1940 contained 28 percent of the nation's entire number of hogs.

From being strictly an "importing" region as concerns livestock and livestock products, the South is working towards self-sufficiency in this respect. Many factors have contributed to bring about this result, not the least of which has been the dwindling world market for King Cotton and the consequent economic pressure to supplement the returns from the old single crop system. State agricultural colleges, agricultural and livestock agents, bankers, newspapers and southern

(*Continued on page* 60)

MANUFACTURE OF DISSOLVING PULPS FROM SOUTHERN PINE

NEVER have American industry and labor faced a graver responsibility than today. A national emergency has been declared to protect any possible threat to our way of life. Beleaguered nations abroad are looking to us for aid in their gallant struggle for independence and liberty.

The South will play an important role in contributing to this national emergency —both industrially and in its contribution of raw materials.

Of primary interest to the wood pulp industry are its vast resources of pulpwood, for approximately 70% (30,000,000 acres) of the long-leaf slash pine region of South Carolina, Georgia and north Florida are devoted to the growth of timber stands.

Of the thousands of species of timber comprising one-third of the land area of the United States, the most satisfactory pulps are made from three species—Spruce, Western Hemlock and Southern Pine. Spruce was considered the best type of wood suitable for the sulphite process until Rayonier Incorporated pioneered Western Hemlock in 1927 and Southern Pine in 1939.

Commemorating its first anniversary this month, Rayonier's newest sulphite mill in Fernandina, Florida can already be termed a veteran. Rayon, or dissolving pulps made from Southern Pine are supplying rayon mills in the South, in other parts of the country and abroad.

What is "Dissolving" Pulp?

Dissolving pulp is a highly refined bleached sulphite wood pulp, which is dissolved by various chemical processes for conversion into rayon, transparent film, lacquers and similar products. It owes its development directly to the introduction of rayon manufacture in this country.

Extracting Cellulose from Wood

Essentially, the fundamental processing steps in the conversion of Southern Pine to sulphite pulp are similar to those employed in the conversion of Western Hemlock.

BY

Madelyn Kurth

The preparation of Southern Pine is simpler than that of the giant Western Hemlock, which, because of its size, must go through a break-down operation to reduce it to handling size.

Southern Pine cordwood is brought in from near-by timber stands by trucks, rail cars or barges and conveyed directly to a huge barking drum on a chain conveyer. These drums have a capacity of 50 cords per hour. As the wood tumbles around inside of these revolving drums, dirt and bark are removed, and water sprays at high pressure wash the logs after they have been barked.

Wood bearing turpentine scars or having ingrown knots not cleanly barked in this operation, go through either a hand barker, or a machine especially developed for the handling of Southern Pine. This is a small portable sawmill, referred to as the "one-man sawmill."

When the logs have been thoroughly cleaned and inspected, they are fed to the chipper which reduces the wood into uniform-sized chips. These chips are run over an oscillating screen which sifts out over and under-sized chips.

Preparing the Cooking Acid

The raw materials required for bleached sulphite pulp manufacture are wood, limerock, sulphur, water and bleaching chemicals.

The sulphur is burned in a rotating burner in the presence of oxygen, giving a combustion gas consisting chiefly of sulphur dioxide. This gas is then injected into the bottom of the huge twin acid towers filled with limestone, while water is admitted into the top. The gas and water form sulphurous acid, which, circulating over the limestone, combines to form a solution of calcium bisulphite and free sulphurous acid. This resultant solution used in the cooking process softens and dissolves away the ligneous materials and loosens the cellulose fibres in the wood chips.

Cooking the Chips

Enormous digesters, 19 feet in diameter and 58 feet high, are filled with wood chips from the storage bin. The cooking acid described above is pumped into the bottom of the digester and heat is applied in the form of steam.

This cooking process liberates the cellulose fibres from undesirable wood substances. When the cooking cycle is completed, the contents of the digester are discharged under great pressure into a blow pit and the brownish fibrous mass is called stock. The sudden release of pressure and the force with which the cooked chips hit the blow target in the blow pit breaks up the disintegrated chips into individual fibres. The fibres are then separated from extraneous matter and this is accomplished by a series of washings and screenings.

Water plays an important part in this purification process. A special water treating plant has been built at Fernandina to treat the millions of gallons of artesian well water used daily. This is designed to contribute toward the physical and chemical purity of the finished pulps.

When the stock has been well washed and screened, all cooking acid and undesirable materials removed, leaving only the cellulose fibres, large quantities of purified water are added to thin the mixture. By running this thinned mixture over riffles and fine screens, dirt particles mixed with the cellulose fibres are carried off by the water as it drains through the screen plates, leaving the stock ready for bleaching.

This is an important step—for bleaching is the final chemical purification process which removes the remaining impurities and incrustations and makes the pulp as white as snow.

Sheet Formation and Drying

The bleached pulp is now ready to be converted into sheets. This is accomplished by equipment which in one continuous operation removes the water from the stock, forms a sheet of matted fibres which is drawn through a series of

press or squeeze rolls led over a series of steam-heated drying rolls. The continuous sheet, having been dried to the proper moisture content is wound onto a reel to form a large roll, called a "jumbo" roll. This is then numbered and transferred to the roll storage pit.

Constant check samples are taken during every step of manufacture and sent to the laboratory for analysis.

Any pulp which does not meet the rigid standards of uniformity for chemical and physical properties such as viscosity, alpha and moisture content, sheet formation, color and cleanliness is rejected.

Since rayon and transparent film manufacturers' steeping presses vary in size, all pulp is "tailor-made" to their individual specifications for size.

After the sheets have received a final inspection, they are baled into 400-pound packages and sent to the warehouse for shipment by rail and water to meet delivery dates specified by customers.

New Trends in Rayon Usage

Few industries parallel the spectacular development of rayon. Not even produced in this country thirty years ago, it is today the second most important textile, exceeded only by cotton in quantity consumption.

Quoting the Merchandise Manager of a large rayon company, "The statistics of rayon consumption during the past year must be regarded as having broader significance than the mere fact that new records were made for volume. There is ample evidence that this record is not a temporary peak in a long cycle, but rather that the volume of rayon usage in America has achieved a new level. This broadening of the rayon business has been achieved not so much at the expense of natural fibres, but as a real increase in per capita usage of rayon products and a response by the customer to the enhanced value which fabricated rayon has offered him for his dollar."

Because of its adaptability to practically any type of construction, woven, knitted, braided or lace, it is at home in materials used for curtains, drapes, upholstery and rugs. Its greatest volume, however, is produced for wearing apparel.

Recently it has become increasingly popular in men's wear, where new surface effects, designs and textures and new color tones are contributing to the "styling up" of men's sports apparel and conventional clothes.

Rayon Rugs

All-rayon and rayon and wool mixture rugs are now being produced commercially. An entirely new texture is achieved with rayon, which, while having a rugged elegance is especially decorative. All carpet class of wool is imported. Approximately 100,000,000 pounds of it were imported during 1939. Since the cost of rayon staple is lower than carpet wool, and is domestically produced, great expansion of this field is anticipated.

Rayon Blankets

The adoption of rayon by large blanket mills indicates that rayon possesses excellent thermal insulation when correctly incorporated in a blanket. The uniform high quality of the rayon fibre makes possible the beautiful clear pastel colors usually found only in very high-priced blankets.

Rayon for Hosiery

Approximately 2,500,000 pounds of silk are used per month in hosiery. Of this figure, Nylon will probably supply about 650,000 pounds. Multi-filament rayon yarns, especially developed for hosiery and extra strong yarns are expected to share substantially in the hosiery market, especially if an embargo is placed upon silk.

Plastics

Plastics in relation to wood pulp covers cellulose nitrate, cellulose acetate, ethyl cellulose and synthetic resins. The major expansions are taking place in the synthetic resin field from which laminated and molded articles are produced.

Four-fifths of the pulp sold by Rayonier to the plastics industry this year went into laminated products and one-fifth went into molding powders. Extensive experiments have been made on wood pulp during the past year in these fields and it is estimated that with certain developments under way, 1941 will see substantially increased tonnages for Rayonier's pulps—particularly for molding compositions.

Bleached stock being thickened and washed.

The tonnage production of plastic molding compositions containing cellulose in the first eight months of 1940 shows an increase of approximately 225% over the same period in 1938.

Cellulose Acetate

The cellulose acetate industry has been expanding by leaps and bounds.

In 1935 the production of acetate was 55,000,000 pounds—in 1939 it was 100,000,000 pounds. 1940 will show an increase of approximately 25% over last year.

Purified cotton linters have been used universally as the cellulose base for acetate manufacture. About five years ago Rayonier started to develop a specially purified wood cellulose, now trade-marked as "Rayaceta," for the cellulose acetate industry. American acetate manufacturers are using this pulp in constantly increasing quantities. Rayonier can manufacture sufficient Rayaceta to supply the entire American acetate industry, including expected expansions in this field, without installing additional equipment.

From a technical viewpoint there is no basic reason why wood cellulose cannot be substituted for cotton cellulose in the acetate industry. While a change of raw material requires certain development work by the user, the substitution of wood for cotton cellulose is a comparatively minor manufacturing problem. It has already been demonstrated that there are certain advantages in using wood cellulose.

Timber Conservation

The greatest natural enemy of the forest in the past has been fire. Statistics show that "On the average, there are 172,000 forest fires a year and 156,000 of these are man-caused!"

The United States Forest Service reports that, "Thirteen million of the thirty-six million acres burned annually are chargeable to intentional fires."

This condition exists chiefly in the South, where a long-cherished tradition, believed to have been handed down by the Indians to the early settlers, in the past has led the farmers deliberately to set fire to the brush and weeds every spring to "green up" the grass for grazing. More than 50% of all commercial and non-commercial forest lands are grazed by domestic livestock. Forage in the South is a resource of forest areas often not owned by the stockmen, but upon which economically the rural poulation is partly dependent.

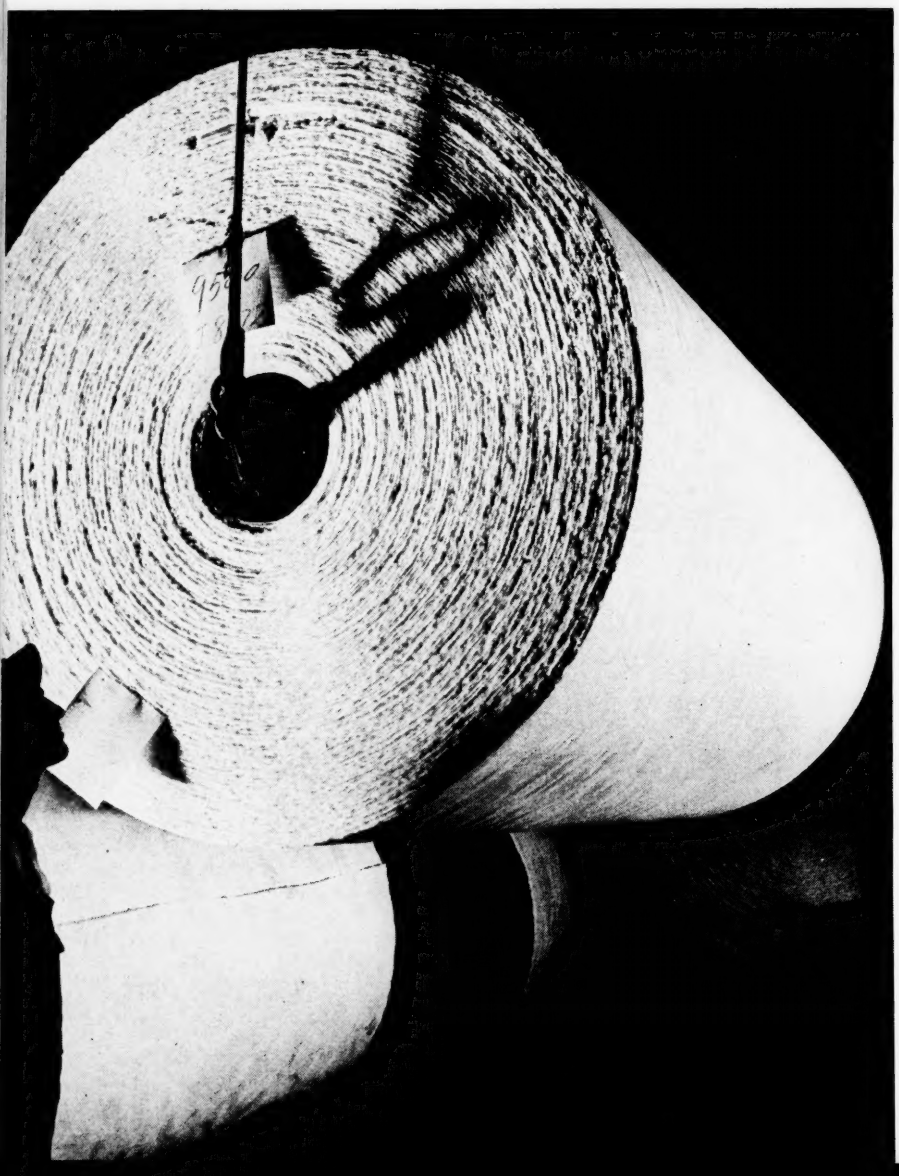
Even if no disastrous forest fires resulted from this practice, the injury to the soil is incalculable, for in a burned woodland the very structure of the soil is changed. Soil which has a forest or grass cover to absorb rainfall prevents destructive surface flow. Destruction by fires can be cut to a minimum by organized protection and enlightened interest and support by the public.

Operating on a program of planned forest management, Rayonier is taking every precaution to perpetuate its vast timber stands in Georgia and Florida so that the productive capacity of its forest lands may progressively be utilized. This program embraces selective logging—cutting only as much timber as can be replaced by current growth; rehabilitation of waste lands and making them productive by reforestation, weeding out stunted, deformed trees and cooperating with the Forest and Park Service to provide organized fire protection.

Fire trucks owned by Rayonier, as well as those owned by the Georgia and Florida Forest & Park Service are equipped with police short wave radio receiver sets which are constantly turned on. When fires are located anywhere in the area by the towers, they immediately call the radio stations maintained by the Forest & Park Service, who in turn call the truck number and name of the patrolman assigned to the area where the fire is located.

Pulpwood cutting areas have been established near Fernandina to demonstrate to farm woodland owners and the public, how the intelligent application of forest management will yield not only more and a better quality of pulpwood, but how timber can be perpetuated to provide an undiminished source of raw material.

The combined production of Rayonier's Fernandina mill, together with its four West Coast mills exceeds that of the total tonnage required for the entire rayon and transparent film industry in the United States.



A roll of rayon pulp, weighing five tons, ready to be cut to specified sheet size.

SULPHUR AND THE SOUTH

J. T. Claiborne, Jr.

BY

J. T. Claiborne, Jr.,

Vice President of Freeport Sulphur Company

A DECADE or two ago the story of sulphur and the South could be confined almost entirely to the development of the brimstone deposits that lie beneath the salt marshes and coastal plains of Louisiana and Texas. Today the story of sulphur and the South embraces not only production but also the other side of sulphur, its consumption.

The increasing use by southern industry and agriculture of this raw material of the South is one of the significant aspects of the region's remarkable progress of recent years. From the oil refineries of Corpus Christi to the coke ovens of Birmingham and the rayon plants of the Carolinas and Virginia, more and more undertakings are making use of sulphur in one or another of its forms. The fertilizer plants of the South require sulphuric acid to make the plant foods which are essential in the growing of cotton, tobacco and other southern crops. Ninety acid plants scattered throughout the South from Maryland to Texas supply this fertilizer industry and other acid consumers.

Disraeli, Prime Minister during the British Empire's great expansion period of the last century, used to say that there was "no better barometer to show the state of an industrial nation than the figure representing the consumption of sulphuric acid." The statement is as true today as it was three-quarters of a century ago. The productivity of the nations of the world can be accurately classified by their sulphuric acid output. The United States of course leads the list. Of the nation's great acid plant capacity, 40 per cent is now located in the South. The 90 southern sulphuric acid plants have an estimated annual capacity of 2,565,000 tons of 100 per cent acid.

At capacity, these 90 plants would require the equivalent of nearly 800,000 long tons of sulphur a year, and sulphur consumed in the South in forms other than acid probably adds an additional 100,000 tons or more to the yearly consumption. Not all of these acid plants use brimstone as the raw material. The nation's largest plant, the one at Copper Hill in Tennessee, and a number of others use pyrites, an ore containing iron and other metals combined with sulphur. The South now leads the other regions not only in the production of brimstone but also of pyrites, with Tennessee the principal producing state. Substantial quantities of pyrites are also produced in Virginia.

In brimstone, the leadership of the South dates back to the invention and commercial application of the Frasch hot water process at the start of the century. The discovery of this method for melting sulphur underground and extracting it in liquid form made possible the economical mining of the Gulf Coast deposits and freed the United States from its dependence on the brimstone of Italy and the pyrites of Spain.

After the development of the original brimstone mine in Calcasieu Parish, Louisiana, by Dr. Frasch's Union Sulphur Company, the first mine in Texas was opened by the Freeport Sulphur Company at Bryanmound. A large part of the capital for the venture in Texas was raised by the Williams family of Richmond, Virginia, through the family banking house founded by John L. Williams just after the Civil War. The family's own capital and that of their friends in Virginia helped pave the way for the continuation of sulphur development in the South. Langbourne M. Williams, Jr., a grandson of John L. Williams, is the present president of the company, now the oldest sulphur producer operating on the Gulf Coast.

With the opening of other mines by the Freeport company and by other subsequent companies, the brimstone mines of the South now supply an estimated 28 per cent of the world's consumption of sulphur from all sources.

The industrialization of the South in recent years has been one of the notable national trends. This movement is, however, but the sum of a great many individual decisions reached by companies and industries. In planning their expansions and penetrating new markets, they have weighed carefully the availability of indispensable raw materials. Because sulphur serves in this relationship to such a wide range of industries, no small credit can be paid this basic mineral for the location in the South of the growing number of new plants which are creating employment throughout the region.

It is interesting to note that one of the most recent developments in the use of sulphur in the South has come in that same Calcasieu Parish within a few miles of Dr. Frasch's first mine. In a plant at Lake Charles, a new synthetic salt cake is being made by fusing together sulphur and a standard alkali to serve the widespread kraft pulp industry. The synthetic product helps replace the imports of the natural product from Germany that have been cut off by the war. At Lake Charles, too, a $4,000,000 oil refinery is under construction. Sulphuric acid is a key material in oil refining.

Baton Rouge, the capital of Louisiana, is rapidly becoming a chemical manufacturing center. Construction there of the first enormous oil refinery several years ago led to the establishment of other ventures, including a large sulphuric acid plant to supply the required acid.

New Orleans has its alcohol production, another industrial process in which sulphur has a part, its fertilizer and its heavy chemicals. At Bogalusa a $5,000,000 container plant expansion is under way. Across the state line in Mississippi is a new tire plant at Natchez, which is even now being enlarged. Sulphur is an essential ingredient in the vulcanization of native rubber, as well as in the production of some synthetic rubbers.

In Mobile, a center of the process industries, pulp and paper mill expansion

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WHAT NOW?

BY

Robt. M. Nelson, LL. D.

THE election of President Roosevelt for a third term is creating wide discussion among business men regarding their future plans and policies. The New Deal laws enacted during the first four years of the present Administration had sent a goodly number of business men scurrying down into the storm cellar. When the President was re-elected for a second term they dug a little deeper. A third term is now staring them in the face.

As a consequence of this situation the flow of private capital into plant expansion has been, with some exceptions, greatly restricted. These exceptions, however, may be pointed to as constituting some of the brightest stars in our economic firmament today. It is, therefore, a question whether or not the hibernating groups have missed the boat during the past eight years, and further as to whether they ought to get aboard now and go along on the next four-year trip.

Among the notable exceptions in the restriction of industry may be cited the case of the paper and pulp business. From 1935 to 1940 over $150,000,000 of new risk capital has been invested in land, buildings, machinery and equipment for the production of pulp, paper, rayon and insulating boards, practically all of which are being made from Southern pine. This great migration of capital was to a large extent brought about through the activities of Dr. Charles H. Herty, the noted Savannah scientist, who achieved national prominence through his experiments with southern pine. It required a depression and the absolute need of lower costs to force this industry to re-locate existing high-cost operations or to expand with southern production which would supplement their northern mills. Nevertheless they DID act in a period when many other heads were mournfully wagging to and fro in a horizontal direction.

To this industry may be added a number of others, such as steel, motors, chemical and building material manufacturers. Statistics covering operations of those new plants in the South during this period indicate that as a result of the courage and initiative of the men responsible for these developments, substantial profits have been made for those corporations, and at the same time a vast new field for permanent employment for hundreds of thousands of workers has been created. Incidentally, these operations have also added new sources of tax revenue for the exchequers of Federal, State and local governments. It is to such creative effort on the part of our industrial leaders and scientific explorations that constitute the main hope of America in getting men off public relief into permanent jobs.

After the 1932 elections a good many business men decided to wait for 1936. When that year rolled around they popped their heads up for another look at the economic and political horizon, but promptly ducked to cover when President Roosevelt was elected for a second term. In 1940 they reappeared on the scene and took some heart in the fact that about 22,500,000 votes were mustered for their candidate against about 27,000,000 votes for President Roosevelt. Now what? Are they going to wait for 1944? That would be twelve years of waiting. And there is no certainty that 1944 will bring us anything different than 1936 or 1940. These Rip Van Winkles of the industrial world might just as well stay out of the woods and play their role whole-heartedly by contributing their services and capital to help bring about the best conditions possible in this time of crisis. Business must go on in this country of over 125,000,000 souls, whether one political party or another occupies the driver's seat in Washington. Food, shelter and clothing—the three necessities of life—will be bought and consumed by these millions in just about the same annual volume in the future as in the past. Added to this, however, is the great and pressing need for all the brains and capital available in this country to produce in volume for the defense of our own country as well as for helping Great Britain and her Dominions to win the war. There must be absolute unity in America in the next four years which all authorities agree will unquestionably be the most critical in the history of our country. Let us all get together and go to work.

The call for national unity should not be limited to the hesitant industrialist. It should include particularly all the labor unions upon which the Administration must depend for the steady, uninterrupted flow of our defense production and for the military equipment for Britain. In some quarters of the Roosevelt Administration resentment has been indicated over strikes that retard production of war orders. The strike reported in the press November 12th is a case in point. C.I.O. workers struck at the Midland, Pa., plant of Crucible Steel Co., according to reports, throwing out of employment 4,300 men. The plant had been working 24 hours a day turning out steel for airplane parts and guns and shells which were machined at the company's New Jersey plant. The C.I.O. is reported to have a contract with the company, but, disregarding it, the employees struck for higher pay. It is unfair to the Government as well as to the company for labor to quit cold and close up a plant operating 100 per cent on war materials in times of emergency. It is just this kind of harrassment that makes private capital hesitate. No progressive business leader expects that the gains labor has made to date should be set aside, but national unity cannot be attained nor can all our production be put to the highest state of efficiency if either capital or labor plays the part of a slacker.

The South is anxious to play its part in the program of national defense along with its plans for more intensive peace time industrial development. Some question has been raised about the economic value of war time industries. It was said that "industries geared solely to the production of national defense requirements might not, in the long run, contribute to the economic benefit of the city. It is a fact that many cities are building up hopes on so-called war industries without reference to the permanent industrial development of the community." It is true that after the last war, vacant buildings, scrapped equipment and unemployment resulted. However, experience is a good teacher. Today, better planning is the vogue. It is believed that location of new war time plants in the South stand a far better chance of being converted into peace time use than would be the case were such plants built in the North. The North is already over-built with industrial brick and mortar. This is partially because of surplus space that remained from the last war and in part due to the

(*Continued on page* 60)

SPOTTING THE FUTURE OF COTTON

BY

Dr. Claudius T. Murchison

President, The Cotton-Textile Institute, Inc.

WITHIN a single generation we have witnessed a large-scale relocation of the cotton-textile industry. The trend has been to the South.

Where 30 years ago the cotton mills in the cotton-growing States had 37 per cent of all the active spindles (the measuring stick of the industry) in the country, ten years ago the percentage had climbed to 58 and today it stands at 77. Thus, three decades have seen the South's industrial stake in cotton more than doubled.

Cotton has been since the early days of the Republic the traditional cornerstone of the South's economy; it is no less so today, although the emphasis on raw cotton has shifted from overseas markets to the United States, and the factor of industrialization has given it an entirely new emphasis.

What does the cotton-textile industry mean to the South? Figures provide the best answer. The 1937 Census of Cotton Manufactures shows that 323,661 men and women were employed in mills in Alabama, Arkansas, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas and Virginia. The South's proportion of American cotton mill employment was 74.3 per cent! These southern mills had in 1937 a payroll of $227,321,883, or 70.1 per cent of the total for the entire industry; and their product was valued at $930,516,881, or 73 per cent of the total.

The butcher, the baker and the candle stick maker, the banker, the newspaper publisher and the restaurateur, the theater operator and the utilities company—all of them benefit from the presence of the cotton mill in the South. All of them have a tremendous stake in the future of American cotton.

That future at the moment seems uncertain despite the fact that cotton consumption in the United States during the 1940-41 crop year promises to exceed all previous records. It seems uncertain because a combination of factors has dealt a severe blow to our great foreign markets for cotton.

The war and the consequent blockade of the entire European continent, the totalitarian policies of economic self-sufficiency and the growth of synthetic fibers have seriously impaired cotton's position in world markets. During the years of American cotton domination, no less than 60 per cent of our crop was exported; according to the most reliable estimates, we will consider ourselves indeed fortunate if we are able to export during the current crop year as much as 1,500,000 bales—or 11.8 per cent of the total crop.

It is almost tragic to think that the difficulties which have beset cotton for more than a decade would have disappeared entirely had it not been for the European War; **for America itself is today consuming more cotton than ever before in its history. It appears likely that the current crop year will see domestic consumption of more than 8,000,000 bales—an all-time record.** Given normal exports of 6,000,000 bales or more, we would have been able to work off the present surplus of some 10,000,000 bales in a few years without any difficulty. And we would have been able to lift, at least in some degree, the present acreage restrictions on cotton which limit cotton plantings to some 25,500,000 acres!

Instead of this rosy picture, we find nothing but immediate gloom—and future hope. Gloom because we find that domestic consumption, despite its record, and exports add up to only 9,500,000 bales—which is about 3,000,000 bales less than 1940-41 raw cotton production. Hope because we know what our problem is and we are addressing ourselves to its solution.

It took no clairvoyance to see as early as September 1, 1939 that our overseas markets for raw cotton would be seriously curtailed. Even as early as that date, we began to lay plans for meeting the many problems which would arise.

We of the cotton-textile industry realized that the raw cotton problem could be easily met by restricting cotton acreage still further. But we who have been brought up in cotton, we who have come to know it and to love it, we who appreciate that into the growing of cotton goes the life and blood of the South—we preferred to see further crop restriction only as an extreme last resort. Further restriction would have saddled the mills, probably, with a processing tax which would have prejudiced the success of cotton goods in the domestic market; but it would have saddled the South with an economic and social problem which far transcends personal profit. Accordingly, we decided to step up, insofar as we could, domestic consumption.

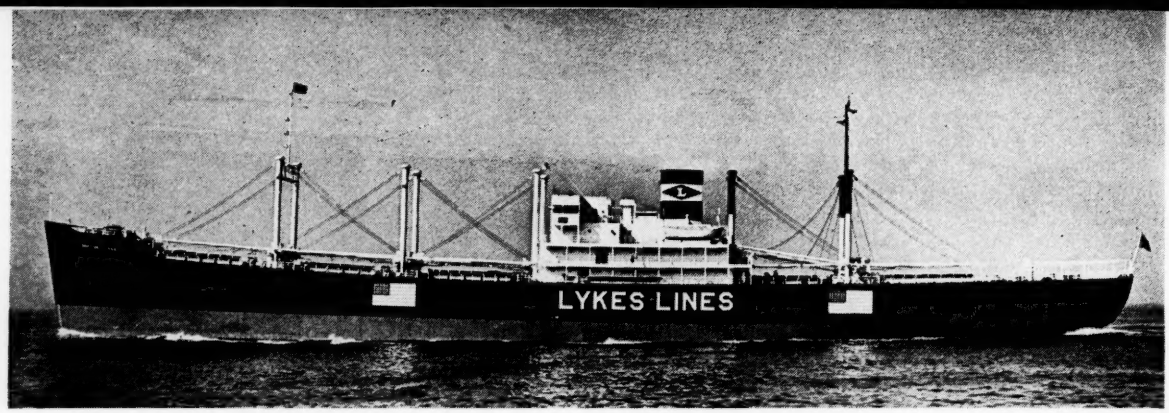
The mathematics of the problem indicated the necessity of obtaining an annual consumption of 10,000,000 bales. At first blush, this seems like a dream, insofar as attainment is concerned, and yet the situation dictates its attainment.

We decided that such a figure, which involves increasing consumption in the United States by 25 per cent over the previous all-time record, could not be achieved by appeals to patriotism. We can wave the flag all we wish, but the woman will still buy according to her idea of values in terms of style, price, quality and of other factors, and the industrial purchasing agent, hard-boiled man that he must be, certainly will continue to be interested only in specifications, performance and price. We decided that such a figure could not be achieved by exhortations to buy cotton, because nobody buys cotton as such—unless it be absorbent cotton; rather, purchases are made in terms of specific merchandise or uses. The Cotton Promotion Program was evolved in accordance with these decisions.

The Cotton Promotion Program of The Cotton-Textile Institute has three main points: (1) to stimulate consumer acceptance of and demand for cotton goods; (2) to stimulate store promotion and selling of cotton goods; (3) to stimulate government co-operation with the program for increased consumption.

Taking the last point first, it is obvious that the Federal government is co-operat-

(*Continued on page* 62)



GULF PORTS' FOREIGN TRADE SERVED BY HUGE FLEET OF ONE FIRM

THE recent launching by the Bethlehem Steel Company at Sparrows Point, Maryland, of the steamships "James Lykes" and "Lipscomb Lykes" for Lykes Brothers Steamship Co., Inc., directs attention to a company that has played a large part in foreign ocean transportation from our southern territory.

In 1937, through expansion by consolidations and acquisition, the Lykes interests were operating 67 ocean-going vessels aggregating over one-half million deadweight tons from various Gulf and South Atlantic ports to the United Kingdom, Continental Europe from the Baltic to Black Sea, North Africa, the West Indies including Puerto Rico, and to Hawaii, Philippine Islands, Japan, China and other oriental territories.

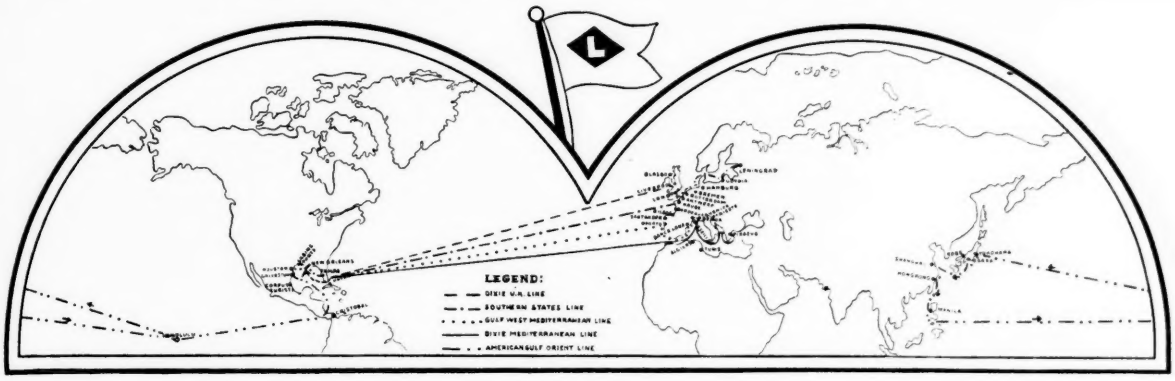
The outbreak of the present war, however, with the requirements of our Neutrality Act, has disrupted our entire trans-Atlantic trades. In spite of this fact, regular and frequent service is still maintained to the West Indies and to the Orient and, starting next January 30, a regular monthly freight service will be inaugurated to South and East Africa touching such ports as Cape Town, Port Elizabeth, East London, Durban, Lourenco Marques and Beira.

Before the establishment of regular sailings by American ships, exporters at Gulf ports were entirely dependent for transportation for their products upon foreign ships which, except to a limited extent, did not maintain regular, scheduled services. The foreign ships that carried traffic to and from Gulf ports were largely controlled by general agencies located in Europe and New York City where rates were made and the character of the service was fixed. The Gulf ports and territories served by them were at a serious disadvantage due to these conditions. Development of foreign trade through the Gulf ports was stifled and the large volume of traffic that should have been handled through American Gulf ports was forced to go to Atlantic ports at additional expense and was subjected to other disadvantages and inconveniences. In fact, the concentration of freight at Atlantic ports at times had caused delays and heavy congestion of traffic.

The Gulf ports needed regular and frequent services. The policy of providing such services to all American ports was adopted by our government in the Merchant Marine Act of 1916. Lykes Brothers Steamship Company undertook to provide such service from and to Gulf ports and began their expansion under the direction and with the cooperation of the Shipping Board.

At the close of the World War the United States Government offered to Lykes Brothers agencies for operating several of the ships that had been built for war purposes and as part of the plan to rehabilitate the American Merchant Marine. The fact that at that time the

Above—One of the new Lykes Lines' ships recently constructed, on its trial trip. Left—The variety of products and region of origin that make up the vast number of commodities shipped on Lykes ships to all parts of the world.



Above—Routes of Lykes Lines in normal times that will soon be augmented by a new route from the Gulf ports to South and East Africa. Below—"Doctor Lykes," one of the 18 ships under construction, as it was launched recently.

firm had agency contracts with foreign companies, as well as foreign flag vessels under charter, made it necessary to divest itself of these foreign affiliations so as to devote its activities entirely to the operation of American ships.

From then on, the Lykes Companies with American ships have carried out the national policy and have provided facilities for the rapid development so necessary to the importers and exporters of the Gulf coast and the great Mississippi Valley country.

Replacement Program

In keeping with the Government's policy as expressed in the Merchant Marine Act of 1936 and the Lykes Brothers' policy, an ambitious replacement program has been undertaken. The company has contracted for the construction of eighteen new vessels—of which nine have already been launched and are committed to the building of four additional vessels for the West Indies trade—making a minimum replacement program of twenty-two vessels. It is anticipated that additional new units will be required to take care of their wide-flung range of operations as soon as world conditions permit the resumption of regular operations.

While having sold a number of the outmoded old vessels, they have retained 30 of the original vessels and these are being utilized in their regular services as well as in other trades essential to our nations' welfare.

Of the eighteen vessels now being constructed, four are C-2 design, ten are C-1 design and another four are C-3 design. Those of the C-2 pattern have a gross tonnage of 6,085 tons and measure almost 460 feet long and 63 feet broad, while the cargo capacity of 8,055 tons is accommodated in five holds. With a cruising radius of 13,000 miles, the normal speed is 15½ knots.

The C-1 design ships having a gross tonnage of 6,829 tons are 417 feet 9 inches long and 60 feet broad and though the cargo capacity of 8,047 tons is only slightly smaller than the C-2 type, these of the C-1 variety each have accommodations for eight passengers.

The largest vessels are the C-3 type whose gross tonnage is 7,773 tons. These are 492 feet long and have a breadth of 69½ feet, while the cargo capacity is 10,446 tons. In addition, these vessels each carry twelve passengers.

In all three of these type ships the improvement of living quarters is particularly noticeable. The captain, chief engineer, and chief officer have individual rooms with individual toilets and showers. The other officers are provided with intercommunicating toilets and showers. Officers staterooms are equipped with settees, wardrobes, desks, drop-leaf tables and medicine cabinets. The mess and recreation rooms for all the officers have adjacent pantries.

The crew likewise have comfortable quarters with hot and cold running water and a strong, large locker in each room. There is a minimum of men per room, usually two. Mess and recreation rooms are provided separately for petty officers and the crew, arranged with long upholstered settees and individual tables for four. A dresser, drinking fountain and bookshelves are installed. A pantry serves both the petty officers and crew and is open at all times.

The company has been consistent in their original policy of concentrating upon the serving of that great southern and southwestern territory. Being natives of the South, this has been not only sound policy but a congenial one to the individuals concerned. Earnest efforts have been made to further the industrial and foreign trade interests of the territory they serve as well as to expand their own operations. The company feels they have made a distinct contribution to the national advancement in the promotion of foreign trade.

The name Lykes for many years has been identified with American shipping. The story of the development of the Lykes shipping interests is in accordance with the American tradition. Starting from a small beginning, the Lykes Brothers organization has reached its present size through the exercise of the good old American qualities of hard work, efficiency and vision.

The present Lykes organization has a background that extends far back into our country's history for the Lykes family inherited their love for shipping and ocean transportation from their grandfather. This seafaring ancestor, Captain James McKay, was a southerner who, by 1850, had a fleet of sailing vessels and two steamships operating from the ports on the Gulf coast in foreign and coastwise trade. But the Lykes Brothers shipping business of today was founded by Dr. H. T. Lykes who moved to Brooksville, Florida, from South Carolina in the early 50's. Engaged in the cattle business, in 1880 he began shipping cattle to Cuba, a newly opened market. In 1899 his sons, Frederick E. and Howell T. Lykes, Jr., were operating steamers from Tampa under the Lykes house flag for at that time ships were very much needed to transport cattle to Cuba and other markets in Central and South America. Their operations out of the Gulf of Mexico continued until in 1906 the Lykes Brothers opened an office in Galveston, Texas, adding to the

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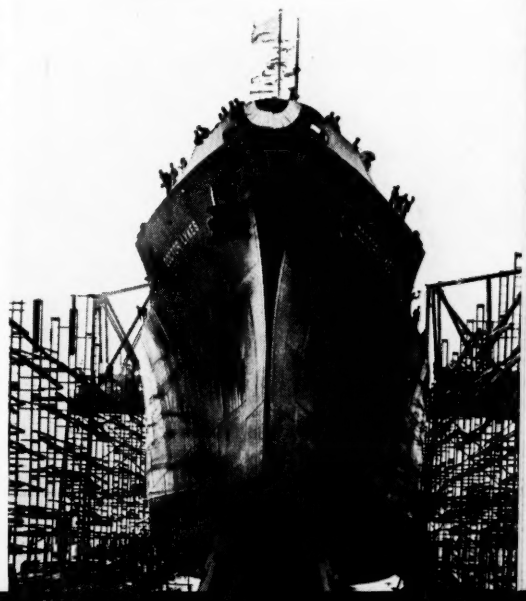


$2,000,000,000 Defense Construction

THE National Defense Advisory Commission in an analysis of the $2 billion to be expended for defense *construction* up to June 30, 1942, states that this sum provides for living quarters, air and naval stations, plant facilities for manufacturing airplanes, tanks, ammunition and other military supplies, shipyards, etc.

An estimated $600 million of this total will be spent for wages on the construction sites in the 48 states and at our territorial defense outposts in Alaska, the Caribbean Islands and the Pacific. The total employment necessitated by this phase of the construction program will total over 730 million man-hours during the next 16 months.

Over $1 billion worth of material orders will be called for and this provides 1,260 million man-hours of employment in mines, forests, and factories and in transporting materials to the construction sites.

Iron and steel products lead in the material orders, with approximately $240 million in sub-contracts either already placed or at present being negotiated. The major part of iron and steel orders (not classified under plumbing, etc.) will be for structural shapes and members, miscellaneous steel building materials.

With a large amount of frame construction called for under the troop housing program ove $140 million worth of orders are for lumber and mill work. In addition to the troop housing program, large quantities of lumber are needed for concrete forms and for trim in the permanent building called for under the program, as well as flooring and other items. Lumber for furniture is not included under this construction analysis.

Brick, hollow tile and cement orders will total $175 million. In addition, sand, gravel and crushed stone, including sand and gravel used in concrete products, will total an additional $80 million.

In the materials requiring more factory finishing, heat and ventilation materials ordered for defense construction total $80 million and plumbing materials for the entire program total $65 million.

Electric wiring and fixture orders come to over $40 million. $15 million worth of contracts provide for electrical machinery, apparatus, and supplies.

Orders for marble, granite, slate and other stone products for defense construction total $18 million.

Wall plaster, wall board, and insulating board will cost $20 million and roofing materials $17 million.

The three remaining major building materials under this analysis are: nonferrous metals and their products, $7 million; tiling, floor and wall and terrazzo, $6 million; paints and varnishes, $7 million.

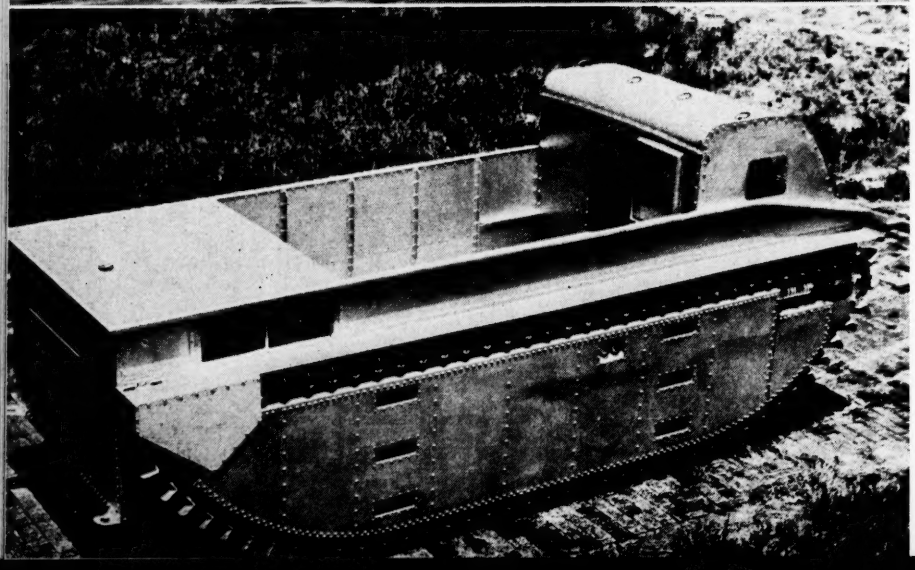
All other materials not listed come to $125 million.

The remaining amount not under site payrolls and material orders includes generally such expense items as legal fees, taxes and profit.

Amphibian Tanks

ANNOUNCEMENT by the Navy of a $3,000,000 contract for 200 amphibian tanks from Donald Roebling of Clearwater, Florida, focuses attention on an interesting southern development.

Although the Navy considers it inadvisable to release any information concerning the specifications and uses to which these tanks will be put, the original designs were for rescue work in flooded areas, and for travel through thick underbrush, swamps, deep water channels, and in regions ordinarily inaccessible. It is claimed the amphibian can travel 15 to 25 miles per hour on land, depending on the roughness of the terrain, that yellow pine and mangrove trees up to eight inches in diameter can be knocked down without injury to the "alligator" or its occupants, and that the maximum climbable grade is a railroad fill of 55 degrees slope.



With water speed of between eight and ten miles per hour, in the open sea, or when landing on a beach through the surf the "alligator" is said to be more seaworthy than a normal boat of comparable size. It will not sink, even with its 7,000 pound cargo compartment full of water; nor will it capsize in a dive into deep water off a six-foot seawall.

The tank is said to be as easily manipulated as an ordinary tractor. Since both land and water propulsion are achieved by means of the same endless chains on each side of the vehicle, there is no change of propulsion when running from land to water or vice versa.

The present models are 20 feet long, 8 feet wide; 8 feet high in front, 6 feet 8½ inches high in the rear.

The driver's cab has seats for three people including the driver. Windows in front are fixed and the door in back when closed makes the cab water-tight.

The passenger or cargo compartment is

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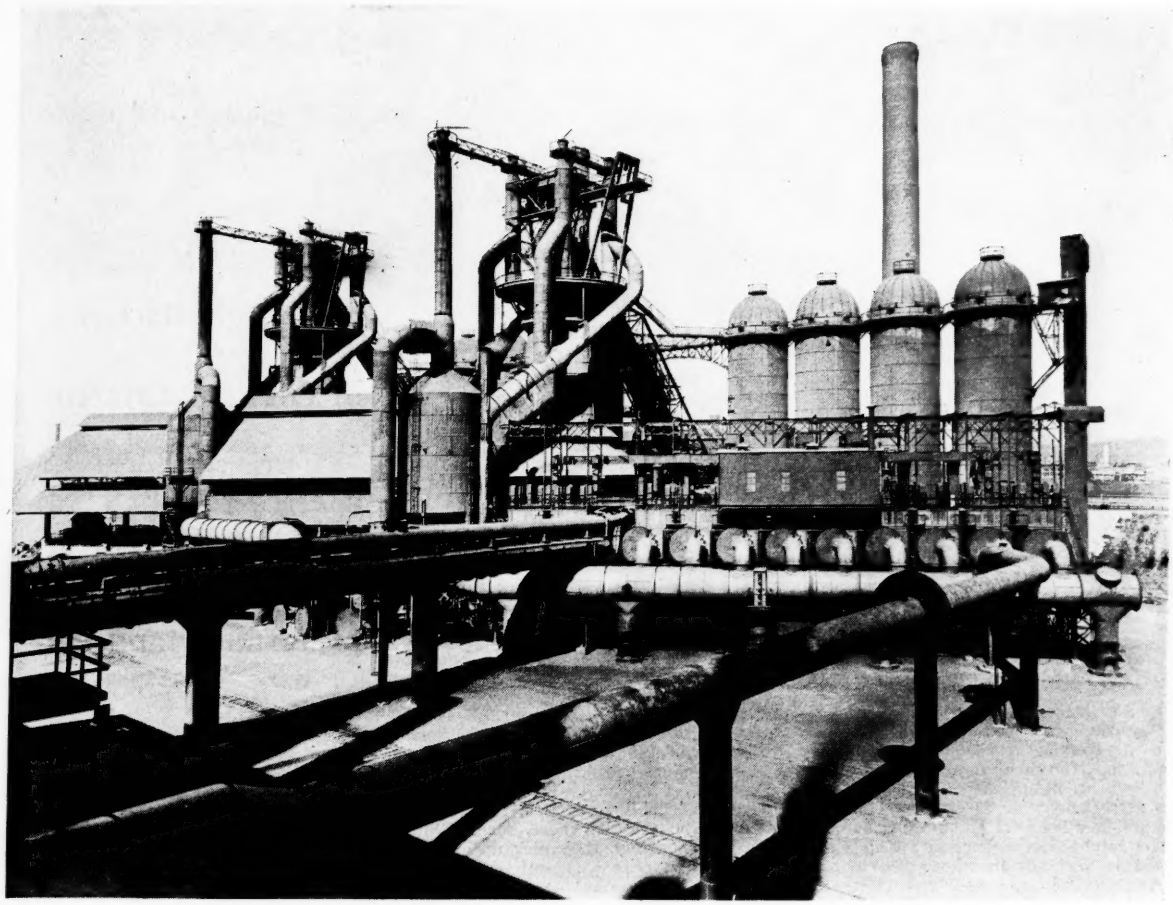


ALABAMA STEEL PLANT TO INCREASE ITS CAPACITY 20 PERCENT

A BROAD program involving expansion of the steel making and finishing facilities at Birmingham, Alabama, of the Tennessee Coal, Iron & Railroad Company, United States Steel subsidiary, was announced recently by Robert Gregg, President.

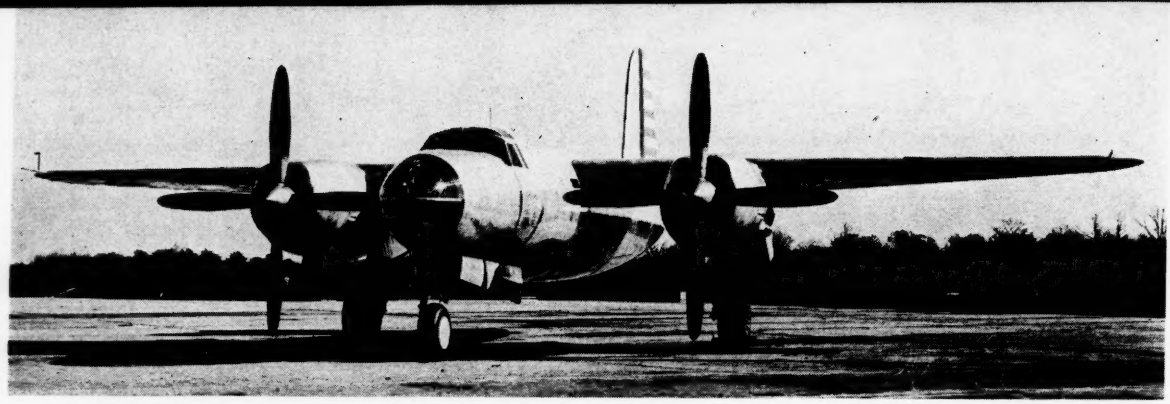
The new facilities, when installed, will result in approximately a 20 per cent increase in the ingot capacity—a little more than 400,000 tons and a corresponding increase in the finishing capacity of the Tennessee Company.

These improvements, which will commence immediately, but which by reason of their nature, will require about 18 months to complete, will then place the Tennessee Company in a materially improved position to carry out any obligations which may be required as a consequence of the National Defense Program.

The improvements comprise the following important features: construction of an additional battery of coke ovens and additional blast furnace at Fairfield Steel Works; improvement to the existing open hearth furnaces; development of ore and coal mining facilities to meet the requirements of the new blast furnace; additions and improvements to the plate mill at Fairfield, including a new 140 inch, 4-high plate mill; additional wire drawing, galvanizing and finishing facilities at the Fairfield Wire Works; and additional processing and finishing facilities at the Fairfield Sheet Mill.

These changes will necessitate enlarged operations at the ore mines, coal mines and quarries including mechanical equipment, additional transportation facilities, and to the extent necessary, enlargements and improvements in the steam, electric power plants and the water supply system.

Above—Tennessee Coal, Iron & Railroad Company's Fairfield blast furnaces numbers 5 and 6 showing gas mains and electric precipitators with hot blast stoves in the background.



STRAIGHT-LINE PRODUCTION METHODS FOR BOMBING PLANES

30,000 Parts Used in Glenn L. Martin Bombers Requires Efficient Materials Handling

BY
Avery McBee

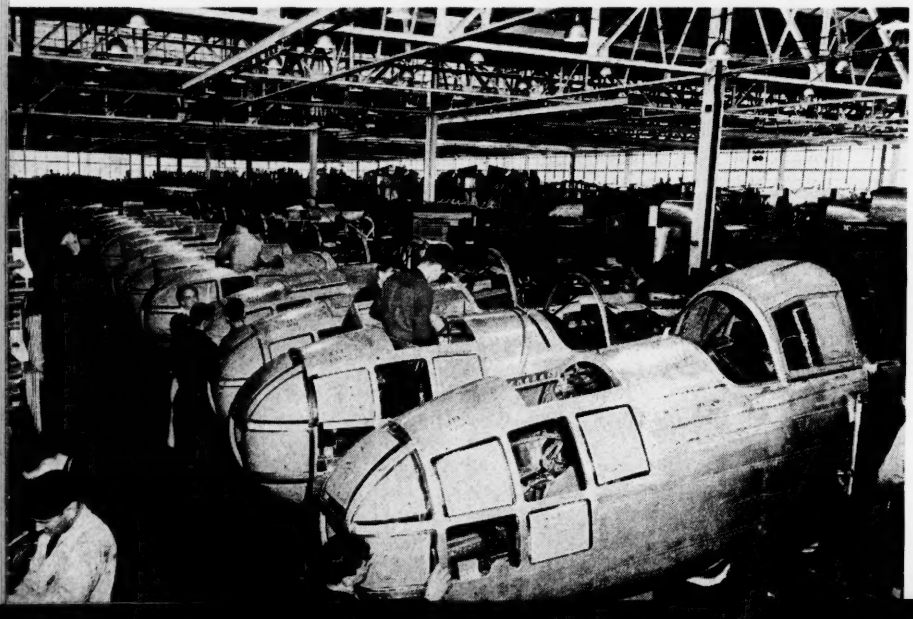
AS the American aviation industry prepares to speed its operations into the field of mass production of military airplanes, the Glenn L. Martin Company's factory at Middle River near Baltimore is attracting wide attention. Here, for years, has been an outstanding example of straight-line production methods that became spectacular when the company went on a war basis nearly two years ago with a record order of bombers for France. Such methods will become more spectacular as the great factory expands rapidly in the emergency.

Tracing the movements of materials that feed the long, rolling assembly lines in this plant is an interesting subject very different from that of most industrial establishments. Here are light, strong metals moving out of stockrooms to machine shops, to heavy presses and drop-hammers, to routing machines and metal stretchers; to bending machines (called "brakes") to other special machines and to metal benches.

These are but the first steps, and from this point finished parts grow under the hands of riveters and welders into fabricated sections which, in turn, become larger sections, until finally they too come together on the assembly lines. Here shiny skeletons grow into center sections, noses, tail sections and wings as they move, each in its own line, toward the final assembly floor where, formed into powerful bombers, they pick up engines and landing gear and roll on out the enormous factory doors to roar defiance in ground tests.

Although light strong metals predominate among aircraft materials, the Glenn L. Martin Company is definitely in the general market. Hundreds of different materials go into the giant bombers. To mention woods, rubber, paint, plastics, glass, fibres, leather, chemicals, wire and textiles would be but to start the list. Altogether the Martin company reaches out into some thirty states of the Union for processed materials and sub-assemblies alone.

The handling of these materials is noteworthy. The main warehouses are at Canton, and the Middle River plant draws constantly on these stores, bringing in day-to-day requirements by big trailer trucks. Besides this, however, is enough direct traffic of materials into and out of the main plant to keep a fussy Pennsylvania Railroad switch engine busy shunting cars over the spur track that leads to the long loading platform.



Glenn L. Martin's newest design, the B-26 medium bomber shown above, last week took to the air for the first time and was tacitly pronounced satisfactory by W. K. Ebel, chief engineer, who with Ed Fennimore piloted the big warbird on its test flight. Rocket shaped with comparatively stubby wings, the new plane made the horizontal takeoff without mishap, circled into the blinding light of the western sun and after thirty minutes of tests during which it apparently was not throttled to its reported top speed of around 400 miles per hour, was brought down for a perfect landing on the east-west runway of the million dollar Martin factory airport. It was then slowly taxied back to the plant to rest beside a 55P1 U. S. Navy patrol bomber and a wasp-shaped bomber destined for the British Royal Air Force. Both Army and Martin officials, the latter including J. T. Hartson, executive vice president, H. F. Vollmer, manufacturing vice president, Robert Young, factory superintendent, T. B. Soden, factory manager, and Howard Bruce, a director of the company, witnessed the tests. As described by the War Department announcement, the B-26 weighs 26,625 pounds, is of midwing monoplane design, has provisions for a crew of five and is powered by two 18-cylinder, 1,850-horsepower Pratt and Whitney engines driving four-bladed, full feathering Curtiss automatic electric propellers of 13-foot six-inch diameter. Its landing gear is of the retractable tricycle type. At left is a view of the production floor at the Martin plant showing the assembly lines.

Over these rails, for example, come parts and sub-assemblies from sub-contracting firms around the country—firms which do nearly 20 per cent of the work on Martin bombers.

Way stop in this tremendous flow of materials is the raw stores department in the Martin plant. Here one finds an orderly array of metals being fed to the machines in the shops. At one end long bars and cylinders and rods of metal lean in symmetrical stacks, while batteries of pigeon holes reveal the ends of other long bars, neatly marked for quick identification with colored paint. It is astonishing to see a workman pick up a 2-by-4-inch metal bar and walk off with it as though it were wood. Yet these aluminum alloys are amazingly light. At the other end of the room is the sheet stock—huge oblongs of shiny duralumin which are stacked in big filing cabinets that turn out to be racks on wheels for ease of handling. Between the bar and sheet supplies is a miscellany of aluminum odds and ends—nuts, bolts, rivets and fittings in revolving bins.

From this capacious heart is pumped the lifeblood of the busy machinery. Bar stock is cut into lengths by big power hacksaws and fed to the machine shop with its multitude of lathes, milling machines, drilling machines and such. Sheet stock is fed into the jaws of giant power shears, which bite them into proper lengths for the sheet-metal machines beyond. Stacks of the sheet move on to the heavy routers—great double-jointed arms that swing from one table to another and dig whirling fingers into the stacks, cutting six or eight sheets at once to a single pattern, as a tailor cuts stacks of cloth with his power knife. With the sheets sandwiched between wooden patterns, the router has but to follow the shape of the pattern.

Mighty presses (one 3,500-tonner is so large the roof had to be raised for it) form these shapes between dies at tremendous pressure. The busy brakes take sheets and strips and bend them into angles or, with another set of dies, corrugate them with a rhythmic beat. In mid-floor two "metal stretchers" form huge sections of airplane skin; two jaws grip the edges of a big sheet while a powerful cylinder forces big wood shapes up against it, forming out in three minutes a section that only recently would have taken as many hours with a bumping hammer. Other special machinery turns out various shapes while a separate department teems with bench workers, doing with hammers and blocks and dies those jobs too minor yet to succumb to mass production.

In a separate building two long rows of heavy drop-hammers smash metal sheets into other large parts, dropping their metal dies in an ear-splitting chorus while hammers chatter a noisy obligato.

How, then, is this flow of materials and parts managed? Chief vehicles of transport from one stage to another are electric trucks designed especially for this work. A silent little tractor draws rubber-tired trailers behind it carrying loads of metals or finished parts along the wood-block aisles to the next stage. Another type of electric truck has two pointed arms jutting out in front and it can pick up a big box or bale or heavy block of metal and carry it away much as one might carry an armful of firewood.

Like busy streets are the aisles as these trucks haul their loads about—from raw stores to machines and benches, from machines to finished parts stockrooms and from finished parts stockrooms to sub-assembly lines.

But they do not bear the entire load. Overhead throughout the Martin plant is a complete railway system, with its switches and main lines and sidings. From the monorail tracks, heavy chains with block and tackle make it possible to hoist heavy loads from the floor—tool-steel, pieces of jigs or fixtures or even heavy machines and roll them to any desired point.

Over on the assembly lines the overhead railway plays an immensely important part. Slings are thrown under the noses and tails and wings and the huge pieces are swung through the air to be fitted together in the final assembly fixture. Powerful engines use the overhead route to reach the yawning nacelles in the wings. In the enormous "Navy Bay," largest aircraft assembly floor in the country, two power cranes are used for picking up the entire hull of a 20-ton flying boat to move it out of its fixture onto cradles on the floor.

To what extent the orderly flow of materials through this great plant—a keystone of the national defense effort—is important may be appreciated when it is realized that a single medium bomber contains between 25,000 and 30,000 separate parts, not counting such ordinary fittings as rivets, bolts, nuts, screws, etc. Long manufacturing experience of Martin production engineers explains much of this efficiency. Aiding in large measure also are the company's Work Simplification Conferences, which band together several hundred men devoted to finding easier and more logical ways of doing things. By no means the smallest factor in this high-efficiency movement is the fact that the plant had been built, building by building, according to a definite plan drawn more than a dozen years ago, before the Glenn L. Martin Company moved to Baltimore from Cleveland.

Fitting into the master plan also are

(*Continued on page 64*)

As production of bombers, such as the new B-26 tested last week, Glenn L. Martin Co., Middle River, Baltimore, rushed construction on a great expansion program variously reported to involve expenditures in the neighborhood of $20,000,000. Excavations are being made, steel work is rising and concrete is being poured for the additions, which when completed will bring Martin floor space to the 3,800,000 square feet needed for national defense activities. The Navy bay, expansion of which is shown in the photograph below already is the largest aircraft assembly floor in the country and the military bay, the steel skeleton of which is seen in the center background, will both be completed shortly after the first of the year. Paul E. Tignor is the Martin field and building engineer in charge of the program.

XUM

WHAT NEXT?

BY

Dr. John J. Wicker,
President, Fork Union Military Academy
Fork Union, Va.

THE election is behind us, but our problems still are before us.

For several years past the Government approach to these problems of the Nation has been from the sociological angle. Other approaches have had small consideration in facing the issues before the American people. We have gone on the principle of mass administration and acted on the theory that to supply easy money, regardless of piling up billions of debts, will buy us a ticket out of the wilderness into the promised land, forgetting that when we have finally spent all, the promised land will turn into a wilderness.

We have gone on the principle that a nation can live better on its debts than it can on its assets. It is interesting to note that this is exactly the policy pursued by the Prodigal Son and his father. The Prodigal said "Give me," and offered nothing in return. Millions upon millions of our people have been taught to stick their hands out to Uncle Sam and say just like the Prodigal "Give me the portion that falleth to me." And just as the father of the Prodigal did what this idling spendthrift asked, so Washington has made the same response, giving out billions of dollars. The Prodigal's father thought he was doing his son a service just as the sociological emphasis has consoled itself with the same thought. I have always thought that when this Prodigal said to his father "Give me the portion that falleth to me," his father would have done well to have handed him a pick and said, "Go dig for it."

Times seemed quite prosperous as the Prodigal threw another man's money away to right and left and yet the nation today is buying the same sort of prosperity. Men who are sound economic thinkers are trembling in their boots as they look ahead and see the day of reckoning—"Pay day has got to come."

Today this country is not only tremendously in debt nationally but individually and men are living, and insisting on living, beyond their incomes.

High powered salesmen may be good for some manufacturers (I doubt it), but they are a terrible danger to the buyers.

A good life insurance man will not knowingly let a man take out more insurance than he can carry just in order to get a little bigger fee for himself, and the same thing is true of every good salesman.

I am tremendously in favor of this country doing a big business, but it is a dangerous day for people who are buying rubber on credit when they can scarcely pay cash for a good pair of leather shoes.

The inclination to go in debt must be matched by character that can stand the strain of pay days to the end. Paying debts is one of the very highest tests of character. It takes stamina, sweat and an ever alive, alert sense of obligation, and these virtues are not found in people who want more than they can pay for. Men who love to pay debts are really loath to go into debt.

When a man's appetite runs ahead of his production he is tempted right then and there to seize some sort of "ism" to get something for nothing, and this is where socialism and communism are his favorite horses, and he mounts in order to get an easy ride on a horse that is fed in another man's stable. His stock in trade is what somebody else owes him. Socialism says "You ought to give me"; Communism says "You have got to give me," and we are threatened every day by both of these isms.

The type of man who says "Give me" is always a liability to himself and everybody else. This principle is true of every boy and girl whether in the home of a millionnaire or the home of a parent struggling for a living.

The man who does not know how to "Take it on the chin," is poorly built above the ears.

Modern sociology offers an easy road where muscle is not made. Biology is the up-hill road of struggle, thrift, self-denial and honest work, and belongs to the hill country, facing north-easters rather than green valleys with the sunshine and lull of Indian summers. Muscle and mental development are made by those who obtain their independence through will power. This is what makes men strong, self-supporting, and real contributors to all the better things of the social order. It is individualism and this country needs it as never before. The sociological route seeks Government regulation, regimentation and has back of it, as administered today, laws out of harmony with all biological development. Biological build makes a man, out of his own sense of social obligation, a voluntary philanthropist, and this is the only sure, genuine progress for human society. Our country will be saved economically and morally by the biological build. The reaction of legalized compulsion coming in taxation and putting philanthropy at a point beyond the endorsement of the sanest economic standard is philanthropic abortion.

We must have preparedness. The right sort of preparedness will cost billions and every red-blooded American must be willing to pay his part. This preparedness will temporarily solve many of our labor problems, and give an appearance of real prosperity. But let us look ahead. Only a few days ago Nathan Straus, administrator for the United States Housing Authority, predicted to a great labor convention that when the defense program ends and this country turns to peace time economy, perhaps five million men would be thrown out of work. What is the country going to do when they get through with the preparedness program? That is exactly what we ought to do right now—and we can.

Southern Railway to Install Diesel Coach Trains in South

Southern Railway System recently announced the purchase of six streamlined, Diesel-operated coach trains of the latest design and construction, scheduled to be put in service early in 1941, between New York and New Orleans via Atlanta, Birmingham and Meridian; and between Washington and Memphis, via Knoxville and Chattanooga. The purchase of this equipment has been made subject to the approval of the Interstate Commerce Commission as to the terms of financing.

The New York-New Orleans all-coach trains will be operated in conjunction with the Pennsylvania Railroad between New York and Washington and the Memphis trains in cooperation with the Norfolk & Western Railway between Lynchburg and Bristol, Va.

Each of the six trains will consist of an observation-lounge-tavern car, 48-seat dining car, baggage-dormitory chair car, chair car coaches and Diesel-powered locomotive, all of light weight construction with ultra-modern streamline effects, with a hostess assigned to each train. The trains will be air-conditioned throughout and all seats will be reserved at no additional cost.

The New York-New Orleans trains will be an entirely new daily service, operating exclusively over the lines of Southern Railway between Washington and New Orleans, while the Memphis trains will replace existing trains Nos. 25 and 26, known as the Memphis Special, handling sleeping cars between Knoxville, Chattanooga and Memphis.

DEFENSE NEWS FROM WASHINGTON

Washington, D. C., Nov. 30 — Announcement at the beginning of November that he may soon ask Congress to provide a large and improved program for plane production preceded by only a day or two a grant by the Priorities Board to the British Government the right to purchase 12,000 planes. Undoubtedly the President was cognizant of these stepped-up British orders and the resultant consequences upon American production when he said that. While the program has not yet reached the draft stage, such steps were regarded as necessay because present production facilities are overtaxed by orders placed since last Spring.

During the month this country released for delivery to Great Britain 26 four-engined bombing planes which had been ordered for the United States Army Air Corps. In exchange for priority on the bombers Britain has released to this country sufficient engines now on order with American firms to equip 41 flying fortresses which would otherwise have been delivered to the Army without engines. In the meantime, negotiations between the two countries continued concerning a release to Great Britain of 20 flying fortresses fully equipped but without the secret bomb sight. The Navy also disclosed this past month that it will permit Great Britain to take first deliveries of a new type, long-range patrol bomber being produced by the Consolidated Aircraft Corp. of California.

Aircraft Orders

Other developments concerning airplanes during November included the following contracts awarded by the Navy: The Pratt & Whitney Aircraft Division of the United Aircraft Corp., $45 million worth of airplane engines; Glenn L. Martin Company, $106 million worth of airplanes; United Aircraft Corporation of Connecticut, $57,807,000 for engines; and The Consolidated Aircraft Corp. of California, $92,500,000 for airplanes and parts. Army contracts included $122,300,000 to the Ford Motor Company for aircraft engines and $11,400,000 to the Wright Aeronautical Corp. also for engines.

As the airplane industry faced even greater expansion because of these developments the President conferred with the National Defense Advisory Council on bottlenecks in certain raw materials and production facilities. In this connection $4,200,000 was awarded to the Vultee Aircraft Corp. for plant expansion; $49,500,000 was provided for construction of a new shell loading plant at Union Center, Indiana, and a new TNT and DNT plant at Weldon Springs, Missouri. Bates & Rogers Construction Company, Chicago, was given a $11,500,000 contract for the Union Center plant on a cost-plus-fixed-fee basis while Todd & Brown, Inc., New York, received a $26,800,000 contract to operate the plant. The Frazier-Brace Engineering Company, New York, received a $11,325,000 cost-plus-fixed-fee contract for construction of the plant at Weldon Springs while the Atlas Powder Company of Delaware will operate the plant under a previously announced contract of $6,390,000. An $8 million project for construction of a new Ordnance Depot at Fort Wingate, New Mexico, was approved at the same time that Day & Zimmerman of Philadelphia were awarded a $34,500,000 contract for design, supervision, equipment and operation of a shell loading plant near Burlington, Iowa. The latter plant also calls for an additional contract involving an expected expenditure of $12 million for construction alone. Still other contracts providing for expanded plant facilities were $11,250,000 to the Douglas Aircraft Company of California for plant expansion at Long Beach; $3,500,000 to the Grumman Aircraft for new facilities at Beth Page, New York; $73,500,000 to Remington Arms Company for operation and equipment of a small arms and ammunition plant at Lake City, Missouri, twelve miles east of Kansas City; while the War Department authorized four firms to start immediately on a $3,500,000 expansion program of gauge making facilities.

Among the other miscellaneous orders connected with national defense that were awarded during November were $20 million for Air Corps ground equipment; $8 million to the Colt Patent Fire Arms Manufacturing Company for installation of equipment in making infantry weapons; $3,205,000 for Ordnance equipment, the largest single contract in this group being $445,000 to the Southern States Equipment Company of Alabama for artillery ammunition components. $3 million for automatic pilots, signal units and other equipment, as ordered from the Sperry Gyroscope Company of New York, and other contracts were awarded in the amount of $8,650,000 for bedding, underwear, and table ware, and $1½ million for 739,000 pairs of arctic overshoes. Artillery ammunition contracts awarded during November included $8 million to the Iowa Ordnance plant of Burlington, Iowa; $5,500,000 to the Ellwood Ordnance plant, Wilmington, Illinois; and $6,600,000 to the Ravenna Ordnance plant of Ohio. One of the most interesting contracts of the month was that placed by the Army with the B. F. Goodrich Rubber Company of Ohio for $5,500,000 worth of rubber caterpillar tracks for scout cars. Scout cars, equipped with these endless built tracks with steel cable centers, can travel up to 55 miles an hour and travel over virtually any type of terrain. Navy awards for ship construction included $1,680,000 to a California firm for 4 mine sweepers; $1,577,000 to a Michigan firm for 4 more mine sweepers. When speaking of the more imminent task of shifting to war production, John D. Biggers, Assistant to NDAC Commissioner Knudsen, said a swift allotment of more than $10 billion worth of contracts since June had necessitated a larger concentration of orders in the industrial Northeast and Coastal regions than might be desired but that the latest stages of the program called for a fanning out of the production load with training of labor and letting of sub-contracts in other areas which lacked the facilities for immediate production.

New Army Construction

Highlights in the field of construction, associated with the defense program, during November included agreements entered into by the War Department, amounting to more than $1 million, for construction of temporary housing at 8 Army posts in Massachusetts and Maine. The War Department also awarded a $5,500,000 contract for construction of a replacement center at Camp Wolters, Mineral Springs, Texas, and in the closing days of the month, the President authorized housing projects to proceed immediately for 300 family dwellings at Jacksonville, Florida; 100 at Pensacola, Florida; 600 at Charleston, S. C.; 1000 at Philadelphia, Pennsylvania; 950 at Vallejo, California; and 800 at Bremerton, Washington. Contract for the last named in the amount of $1,000,800 by the USHA was awarded to the West Coast Construction Company and the Western Construction Company at Seattle.

National Defense Program Awards in the South

ALABAMA

Unit	*Manufacturer*	*Item*	*Amount*
Qtmtr. Corps	Rust Engineering Co., Pittsburgh, Pa.	Design and construction of shell forging and machinery plant at Gadsden, cost	$1,138,000
" "	Miller & Company, Inc., Selma	Parts for tents	43,000
Ordnance	Tennessee Coal, Iron & R. R. Co., Birmingham	Artillery ammunition components	5,823,600
"	Goslin Birmingham Mfg. Co., Inc., Birmingham	Artillery ammunition components	1,740,000
Supplies & Accts.	Gardiner-Warring Co., Inc., Florence	Cotton undershirts	74,900
" " "	Hardie Tynes Mfg. Co., Birmingham	Air compressors	505,542
Qtmtr. Corps	West Point Mfg. Co., Fairfax	Bath towels	72,210
Ordnance	Southern States Equipment Co., Birmingham	Artillery ammunition components	440,534
Qtmtr. Corps	Utica Knitting Co., Oriskany Falls Navy Yard, Anniston	Woolen drawers & undershirts	131,736
" "	Gardiner Warring Co., Florence	Woolen drawers & undershirts	353,746
Ordnance	Stockham Pipe Fittings Co., Birmingham	Artillery ammunition	571,200

FLORIDA

Qtmtr. Corps	Aqua Systems, Inc., NYC, N. Y.	Air Corps gasoline fueling systems at Orlando Airport	58,134
" "	E. E. J. Pfotzer, Pensacola, Fla.	Engine test building at Southeast Air Depot, Mobile, Ala.	268,780
Supplies & Accts.	Marine Engine Works & Shipbuilding Co., Tarpoon Springs	Motor launches	19,200
Yards & Docks	W. P. Thurston Co., Richmond, Virginia	For rehabilitation of submarine base facilities and construction of marine railway at the Naval Station, Key West	923,000

GEORGIA

Air Corps	Strachan Skyways, Inc., Savannah	Aircraft engine fuel	120,000
Qtmtr. Corps	Peerless Woolen Mills, Rossville	Wool blankets	1,950,000
Ordnance	Letourneau Co., Toccoa	Artillery ammunition components	4,569,290
Qtmtr. Corps	Rome Mfg. Co., Rome	Cotton trousers	15,262
" "	Holeproof Hosiery Co., Marietta	Cotton socks	26,316
" "	Golden City Hos. Mills, Inc., Villa Rica	Cotton socks	24,840
" "	Richmond Hosiery Mills, Rossville	Cotton socks	72,700
" "	Empire Mfg. Co., Winder	Denim working coats	133,500
" "	Classic City Overall Co., Athens	Denim working trousers	33,800
" "	Nunnally & McCrea Co., Inc., Atlanta	Denim working trousers	41,292
" "	Lowell Bleachery, South Griffin	Bath towels	73,770

KENTUCKY

Ordnance	Tube Turns, Inc., Louisville	Artillery ammunition components	668,610
Air Corps	Reynolds Metals Co., Louisville	Aluminum	80,148
Qtmtr. Corps	Louisville Tin & Stove Co., Louisville	Parts for stoves, tent	17,750
" "	Bourlier Sheet Metal Works, Louisville	Parts for stoves, tent	30,350

LOUISIANA

Supplies & Accts.	Higgings Industries Inc., New Orleans	"Eureka" type boats	2,177,500
" " "	W. E. Trotter and Son, Crowley	Rice	34,279

MARYLAND

Qtmtr. Corps	Howard Uniform Co., Baltimore	Wool service coats	17,207
" "	Maryland Workshop for the Blind, Baltimore	Mosquito bars	47,500
" "	Wm. E. Hooper & Sons Co., Baltimore	(Duck) tentage	66,125
" "	A. W. Pruitt, Crisfield	Manufacture of tents, pyramidal	31,750
Ordnance	Triumph Explosives, Inc., Elkton	Ammunition components	242,274
Qtmtr. Corps	Mount Vernon-Woodberry Mills, Inc., Baltimore	Duck for tents, pyramidal	907,915
Ordnance	Revere Copper and Brass, Inc., Baltimore	Small arms & ammunition	896,006
Air Corps	The Glenn L. Martin Co., Baltimore	Armament equipment	738,555
Signal Corps	Bendix Radio Corp., Baltimore	Frequency meter sets	878,632
" "	Bendix Radio Corp., Baltimore	Radio compasses	1,834,436
Qtmtr. Corps	Mt. Vernon-Woodberry Mills, Baltimore	Cotton duck	106,000
Supplies & Accts.	Acme Steel Engineering Co., Inc., Baltimore	Mooring buoys	86,765
Yards & Docks	Baltimore Mail Line, Baltimore	Purchase of five vessels by the Navy Department	7,100,000
Supplies & Accts.	S. Rosenbloom, Inc., Baltimore	Jungle cloth jackets and trousers	72,660
" " "	The Glenn L. Martin Co., Baltimore	Airplanes	106,125,396
Qtmtr. Corps	Iron King Overall Co., Baltimore	Denim working coats	43,283
" "	Casey Jones, Inc., Baltimore	Denim working trousers	458,671
Ordnance	Crown Cork & Seal Co., Baltimore	Small arms material	1,147,030
Qtmtr. Corps	S. Rosenbloom, Inc., Baltimore	Cotton mattress covers	49,975
" "	Howard Uniform Co., Baltimore	Wool service coats	36,359
" "	H. Borenstein & Sons, Baltimore	Wool service coats	38,115
" "	S. Rosenbloom, Inc., Baltimore	Mosquito bars	29,705
Supplies & Accts.	Reid Avery Co., Baltimore	Steel welding electrodes	29,880
" " "	Revere Copper & Brass, Inc., Balto. Div., Baltimore	Copper tubing	100,313
" " "	William E. Hooper & Sons, Baltimore	Cotton canvas	39,909

MISSISSIPPI

Qtmtr. Corps	Hayes Industries, Inc., Jackson	Wheel assemblies	613,629

MISSOURI

Air Corps	Cowden Mfg. Co., Kansas City	Mechanics suits	213,060
" "	Standard Steel Works, North Kansas City	Trailers, dollies, spare parts	173,809

Unit	*Manufacturer*	*Item*	*Amount*
Qtmtr. Corps	Carnie-Goudie Manufacturing Co., Kansas City	Canvas cot covers	$19,050
" "	Independent Awning Co., Inc., Kansas City	Canvas cot covers	25,480
" "	Rice-Stix Dry Goods Co., St. Louis	Trunk lockers	41,850
" "	Neevel Mfg. Co., Kansas City	Trunk lockers	106,250
Ordnance	Landis Machine Co., St. Louis	Artillery ammunition components	769,100
"	Carter Carburetor Corp., St. Louis	Artillery ammunition components	1,335,536
"	Emerson Electric Mfg. Co., St. Louis	Artillery ammunition components	822,232
"	Atlas Powder Company, Wilmington, Del.	Operation of TNT plant at Weldon Springs	6,390,000
Air Corps	Valley Electric Corp., St. Louis	Grinders and buffers	23,735
Qtmtr. Corps	Burlington Mfg. Co., Kansas City	Working suits	13,896
" "	Brown Shoe Co., Inc., St. Louis	400,000 pairs service shoes	1,159,000
" "	International Shoe Co., St. Louis	620,000 pairs service shoes	1,688,900
Supplies & Accts.	W. B. Knight Machinery Co., St. Louis	Vertical milling and boring machines	24,298
Qtmtr. Corps	A. F. Martin Mfg. Co., Tipton	Denim working trousers	21,239
" "	Wackman Welded Ware Co., St. Louis	Tent stoves	47,000
" "	Correct Cap Co., St. Louis	Denim working hats	31,840
" "	Morose Cap Co., St. Louis	Denim working hats	18,900
" "	Premium Cap Co., St. Louis	Denim working hats	162,159
" "	Newel Manufacturing Co., Kansas City	Fibre chests for outfits officers' mess	42,483
" "	International Shoe Co., St. Louis	Leather boots, legging top	132,627
" "	Fraser-Brace Engineering Co., Inc., New York, N. Y.	For the construction of a TNT and DNT plant at Weldon Springs. The site is in the vicinity of St. Charles. (The Atlas Powder Co. of Wilmington, Del., will operate the plant.)	11,325,000
" "	Western Last Co., St. Louis	Shoe lasts	32,500
" "	Marx & Hass-Korrekt Co., St. Louis	Wool service coats	43,037
Supplies & Accts.	A. P. Green Firebrick Co., Mexico	Refractories, fire clay, mortar, refractory	24,545
" " "	Laclede-Christy Clay Products Co., St. Louis	Fire brick	19,140

NORTH CAROLINA

Qtmtr. Corps	Cramerton Mills, Inc., Cramerton	Cotton cloth lining for overcoats	226,710
" "	Marshall Field & Co., Spray	Wool blankets	261,000
" "	Chatham Mfg. Co., Elkin	Wool blankets	1,923,750
" "	The Leakville Mollen Mills, Inc., Charlotte	Wool blankets	338,560
" "	Maurice Mills Co., Thomasville	Cotton socks	150,000
" "	Ragan Knitting Co., Thomasville	Cotton socks	112,625
" "	Elliott Knitting Mills, Inc., Hickory	Cotton socks	77,112
" "	Adams-Millis Corp., High Point	Cotton socks	150,000
" "	Guilford Hosiery Mills, Inc., High Point	Cotton socks	65,000
" "	Thomas Mills, Inc., High Point	Cotton socks	61,152
" "	Waldensian Hosiery Mills, Inc., Valdese (Drexel, N. C.)	Cotton socks	25,500
" "	Standard Hosiery Mills, Inc., Alamance	Cotton socks	48,000
" "	Blue Bell-Globe Mfg. Co., Greensboro	Denim working trousers	483,000
" "	Hickory Overall Co., Hickory	Denim working trousers	40,000
" "	Carolina Engineering Co. of Durham, Durham	Heating and sheet metal work at Fort Bragg	120,000
" "	Batavia Mills, Inc., Mooresville	Bath towels	37,433
" "	Cone Export & Commission Co., Cliffside	Bath towels	36,985
" "	The Windsor Co., Kannapolis	Bleached cotton bed sheets	768,870
" "	Samisch Textile Co., Yadkin	Bleached cotton bed sheets	52,349
" "	Erwin Cotton Mills Co., West Durham	Bleached cotton bed sheets	311,809
" "	Cone Export & Commission Co., Yadkin	Bleached cotton bed sheets	35,200
" "	Marshall Field & Co., Spray	Bleached cotton bed sheets	128,190
" "	Cone Export & Commission Co., Yadkin	Bleached cotton bed sheets	104,565
" "	Washington Mills Co., Winston-Salem	Woolen drawers & undershirts	182,880
" "	Mount Airy Knitting Co., Mount Airy	Woolen undershirts	27,212
" "	Lamport Mfg. Supply Co., Biltmore	Bleached cotton bed sheets	23,593

SOUTH CAROLINA

Qtmtr. Corps	Southern Weaving Co., Greenville	Parts for belts, web, waist	38,900
" "	Pacific Mills, Lyman	Bleached cotton bed sheets	127,792

TENNESSEE

Qtmtr. Corps	Hardwick Woolen Mills, Cleveland	Wool service coats	32,484
" "	A. L. Kornman Co., Nashville	Wool service coats	61,577
Ordnance	The Fulton Sylphon Co., Knoxville	Artillery ammunition components	205,500
Qtmtr. Corps	Springfield Woolen Mills, Springfield	Wool blankets	190,575
" "	Lebanon Woolen Mills, Inc., Lebanon	Wool blankets	488,625
" "	Anderson Tully Co., Memphis	Parts for tents	201,150
" "	Downcraft, Inc., Memphis	Cotton filled comforters	100,893
" "	General Shoe Corp., Nashville	240,000 pairs service shoes	710,400
" "	Margate Hosiery Mills, Inc., Chattanooga	Cotton socks	26,000
" "	O'Bryan Bros., Inc., Nashville	Denim working coats	31,601
" "	Marshall Stove Company, Lewisburg	Stoves, heating, coal burning	60,760
" "	Standard Knitting Mills, Knoxville	Woolen drawers	323,337

TEXAS

Qtmtr. Corps	The Dallas Cotton Mills Company, Dallas	(Duck) Tentage	240,000
" "	Crawford-Austin Manufacturing Co., Waco	Canvas cot covers	53,200
" "	Waco Tent and Awning Co., Waco	Canvas cot covers	64,000
" "	Wilkins Trunk Mfg. Co., Dallas	Trunk lockers	27,300
" "	Conro Mfg. Co., of Texas, Dallas	Denim working coats & trousers	281,718
" "	Waco Garment Mfg. Co., Inc., Waco	Denim working coats	45,905

(*Continued on page 63*)

South's Contracts Hit Record Peak for Eleven Months

November Total $183,039,000

Industrial Projects Up, Private Work Steady, as Public Program Slows

SOUTHERN construction contracts for the eleven months ending November 30 are at the record breaking total of $1,244,711,000. Never before in the history of the area below the Mason and Dixon line, as far as ascertainable from available statistics, has such a high figure been reached not only during an eleven-month period but during any one year.

Public construction leads the various types of work with a total of $490,357,000. Industrial awards rank second at $343,713,000. Private building is in third place with a total of $147,372,000. Fourth and fifth positions are occupied by highway work and engineering projects, with totals of $137,882,000 and $125,387,000 respectively.

The valuation of November industrial awards, as published in the *Construction* daily bulletin, is $89,321,000. Leading the privately financed projects was the huge program the United States Steel Corp. is launching for its Alabama subsidiary, the Tennessee Coal, Iron and Railroad Co. This work has been estimated as involving $25,000,000 to $30,000,000. Industrial construction, much of which is the result of the defense program, is now at a peak.

The total of November government awards of $53,738,000 was slightly less than half the figure of the preceding month. Public housing, however, increased 56 per cent as compared with October, the total being $10,147,000. Private residential work, including apartments and hotels was valued at $9,658,000, a 45 per cent increase over the October level.

Texas, where the huge naval air training base is being built at Corpus Christi and large industrial projects including the big North American Aviation plant at Dallas are going forward, led the parade of sixteen States with an eleven-month total of $220,598,000. A big rayon plant addition, a new nylon factory, as well as great shipbuilding and naval station expansions are underway in Virginia, which took second place with a total of $176,603,000. Three other states —Florida, Maryland and West Virginia— all turned in totals over the hundred million dollar mark, as the rest of the States made showings ranging from $71,624,000 for Georgia to $20,326,000 for Arkansas.

Early in the month, according to *Construction* daily bulletin reports, the Board of Aldermen of St. Louis, Mo., authorized lease of a 35-acre site at the municipal airport to Curtiss-Wright Corp. for its proposed $8,000,000 plant. Tennessee Valley Authority was empowered to use Muscle Shoals nitrate plant No. 2 for ammonium nitrate production, an arrangement which included a new phosphatic plant near Godwin, Tenn. and an expenditure of $6,500,000. James Stewart & Co., New York, received the award for the $6,500,000 North American Aviation plant at Dallas, Texas.

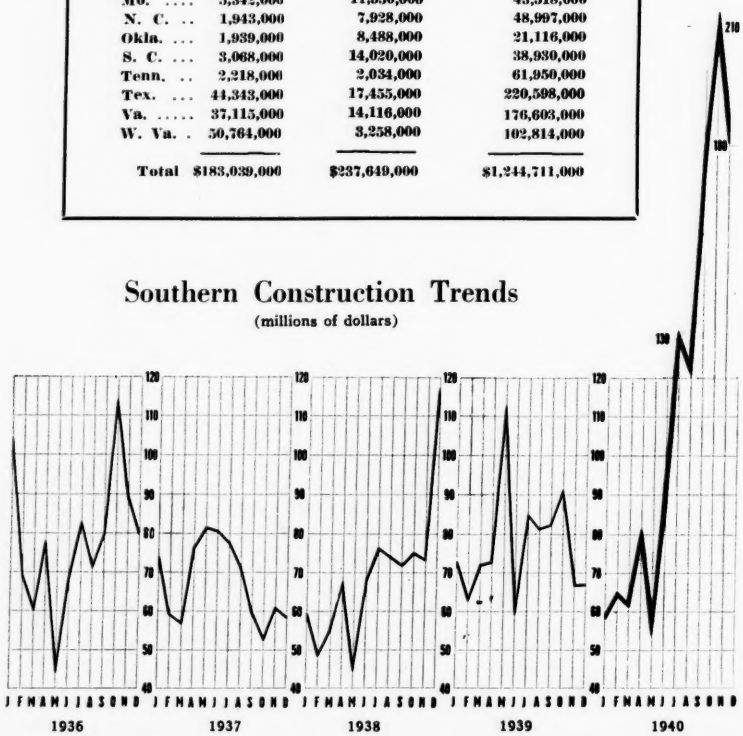
Announcement was made of a $50,000,000 contract between the United States Navy and Carnegie-Illinois Steel Corp., replacing an originally planned $20,000,000 program for expanding armor plate

South's Construction by States

	November Contracts Awarded	Contracts to be Awarded	Contracts Awarded First Eleven Months 1940
Ala.	$1,358,000	$52,828,000	$556,155,000
Ark. ...	1,086,000	1,483,000	20,326,000
D. of C.	4,741,000	17,960,000	49,276,000
Fla.	7,419,000	12,915,000	106,370,000
Ga.	7,503,000	29,272,000	71,624,000
Ky.	2,351,000	10,560,000	24,500,000
La.	4,008,000	11,346,000	55,910,000
Md.	5,645,000	18,759,000	105,212,000
Miss. ...	2,196,000	3,677,000	40,812,000
Mo.	5,342,000	11,550,000	43,518,000
N. C. ..	1,943,000	7,928,000	48,997,000
Okla. ...	1,939,000	8,488,000	21,116,000
S. C. ...	3,068,000	14,020,000	38,930,000
Tenn. ..	2,218,000	2,034,000	61,950,000
Tex. ...	44,343,000	17,455,000	220,598,000
Va.	37,115,000	14,116,000	176,603,000
W. Va. .	50,764,000	3,258,000	102,814,000
Total	$183,039,000	$237,649,000	$1,244,711,000

Southern Construction Trends

(millions of dollars)



facilities at the South Charleston, W. Va., Naval ordnance plant. Bids were received for a $4,225,000 tail canal for the Santee-Cooper hydroelectric project of the South Carolina Public Service Authority, Charleston.

Continental Can Co., scheduled the breaking of ground for its $1,000,000 St. Louis, Mo., plant as work proceeded on a large addition at Baltimore. The Federal Power Commission approved the declaration of intention of the Nanthala Power & Light Co., Aluminum Company of America subsidiary for its 300,000-horsepower Fontana project on the Little Tennessee River in North Carolina. Bechtel-McCone-Parsons, of Los Angeles, started plans for the administration building of the $5,000,000 Orange, Texas plant of Consolidated Steel Corp., which has a twelve-destroyer contract with the United States Navy.

M. R. Harrison Construction Corp., Miami, Fla., received the contract for a $5,000,000 plant for Intercontinent Aircraft Corp., a Miami concern capitalized at $1,500,000. Reynolds Metals Co., Inc., which is building the $23,500,000 aluminum plant at Sheffield, Ala., received the contract to erect and operate a $1,000,000 Navy shell fuse plant at Macon, Ga. Interests identified with the British Purchasing Commission were reported engaged in negotiations for constructing a $10,000,000 ship assembly plant. Two Southern cities, Baltimore, and New Orleans, were among the sites being considered.

Kentucky Utilities Co. proposed a $3,000,000, 25,000-kilowatt steam-electric generating plant on the Kentucky River near Tyrone, Ky. Jefferson Island Salt Co., Jefferson Island, La., made plans to rebuild its $1,000,000 plant destroyed by fire three months ago. Fraser-Brace Engineering Co., New York, received the $11,325,000 contract for constructing TNT and DNT plant to be operated at Weldon Spring, Mo., by Atlas Powder Co. Initial work proceeded on the $11,000,000 nylon yarn plant of E. I. du Pont de Nemours & Co., Martinsville, Va.

The War Department announced an $11,857,000 contract with Humble Oil and Refining Co., for facilities to produce toluol at Baytown, Texas. The award included construction of a $10,760,000 plant to be known as the Baytown Ordnance Works, near the company's present plant. Woodward Iron Co. of Woodward, Ala., was reported as considering opening a new iron ore mine at a cost of $2,000,000. The Navy Department has plans underway for a $2,500,000 town to be built in connection with shipbuilding activities at Pascagoula, Miss.

Louisville, Ky. was selected as the site for a $4,500,000 Naval ordnance plant. Southern Aircraft, Inc., proposes to start work soon on an airplane manufacturing plant to be built on a 183-acre site at Dallas, Texas. A location was picked at Lake City, Mo., for the War Department's $12,000,000 ammunition plant to be operated by Remington Arms Co., and an army supply depot at a similar cost is to be built in Henry County, southeast of Atlanta, Ga. Steps were also taken to secure 10,640 acres in Calhoun County, Alabama for an ammunition storage depot.

Virginia Public Service Co., Alexandria, Va. announced plans for $2,000,000 addition to its newly finished plant.

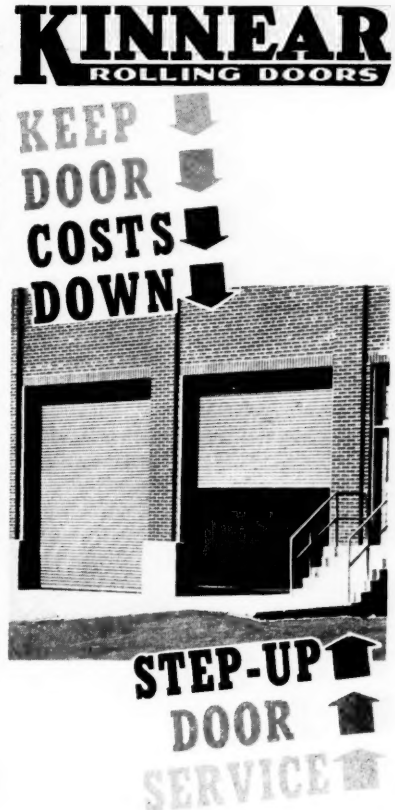
Industrial

(Industrial, Electric Railways, Railroads, Buses, Telephones, Docks, Steamships)

	November, 1940		Contracts Awarded First Eleven Months 1940
	Contracts Awarded	Contracts to be Awarded	
Ala.	$150,000	$33,643,000	$23,184,000
Ark.	.....	150,000	3,314,000
D. of C.	.....	.....	3,918,000
Fla.	181,000	710,000	11,440,000
Ga.	1,494,000	406,000	11,802,000
Ky.	.....	.....	4,446,000
La.	2,088,000	1,295,000	15,013,000
Md.	959,000	10,120,000	37,693,000
Miss.	345,000	32,000	5,332,000
Mo.	1,803,000	165,000	6,542,000
N. C.	290,000	775,000	8,157,000
Okla.	160,000	.....	3,537,000
S. C.	108,000	65,000	4,437,000
Tenn.	1,115,000	180,000	21,765,000
Tex.	19,506,000	878,000	62,468,000
Va.	11,122,000	307,000	59,020,000
W. Va.	50,000,000	35,000	61,645,000
Total	$89,321,000	$48,761,000	$343,713,000

Statistics of South's Construction

	November, 1940		Contracts Awarded First Eleven Months 1940	Contracts Awarded First Eleven Months, 1939
	Contracts Awarded	Contracts to be Awarded		
PRIVATE CONSTRUCTION				
BUILDING				
Assembly (Churches, Theatres, Auditoriums, Fraternal)	$998,000	$1,617,000	$17,936,000	$15,045,000
Commercial (Stores, Restaurants, Filling Stations, Garages, etc.)	1,171,000	2,256,000	27,000,000	29,112,000
Residential (Apartments, Hotels, Dwellings)	9,658,000	2,588,000	91,684,000	87,224,000
Office	456,000	870,000	10,752,000	16,504,000
	$12,283,000	$7,331,000	$147,372,000	$147,885,000
INDUSTRIAL	$89,321,000	$48,761,000	$343,713,000	$154,769,000
PUBLIC CONSTRUCTION				
BUILDING				
City, County, State, Federal	$53,738,000	$116,580,000	$376,047,000	$110,720,000
Housing	10,147,000	9,235,000	88,931,000	65,544,000
Schools	2,672,000	8,473,000	25,379,000	59,889,000
	$66,557,000	$134,297,000	$490,357,000	$236,153,000
ENGINEERING				
Dams, Drainage, Earthwork, Airports	$1,529,000	$12,522,000	$54,137,000	$59,432,000
Federal, County, Municipal, Electric	1,670,000	9,354,000	61,534,000	83,378,000
Sewers and Waterworks	324,000	8,307,000	9,716,000	26,307,000
	$3,523,000	$30,183,000	$125,387,000	$169,117,000
ROADS, STREETS AND BRIDGES	$11,355,000	$17,077,000	$137,882,000	$151,266,000
TOTAL	$183,039,000	$237,649,000	$1,244,711,000	$859,190,000



You can do BOTH with Kinnear Steel Rolling Doors. They've *proved* their low-maintenance operation and lasting dependability through nearly half a century—against some of the toughest door conditions encountered anywhere!

It is easy to see why! The rugged strength of Kinnear's famous interlocking-slat construction *(originated by Kinnear)* means extra durability — PLUS a degree of flexibility that tends to prevent damage under accidental blows or any sudden impact. And the Kinnear Rolling Door's all-steel curtain assures greater protection against fire, wind, weather, riot, theft, sabotage, etc.

Still further, the vertical, coiling operation of Kinnear Rolling Doors gives you extra square yards of floor and wall space . . . keeps the doors out of the way of plant operations and out of reach of damage when open . . . prevents snow, ice or swollen ground from hampering the smooth, easy, counter-balanced operation of the doors. Take the first step toward real door economy *now* by sending for full details! Write!

The KINNEAR Mfg. Co.
1600-20 FIELDS AVENUE
COLUMBUS OHIO
Offices and Agents In Principal Cities
Factories: San Francisco; Columbus

New Industrial Plants and Expansions in the South During November, 1940

Contracts Awarded

Ala., Alexander City—Alexander City Coca-Cola Bottling Co.; plant alterations and additions ..... $ 18,000
Ala., Birmingham—George A. Hormel Company; packing plant .....
Ala., Woodward—Woodward Iron Co.; air conditioning ...

Fla., Auburndale—McDonald Corporation; Canning plant.. 50,000
Fla., Jacksonville—Florida Motor Lines System; busses.... 250,000
Fla., Lakeland—Peoples Packing Co.; canning plant .....
Fla., Miami—Intercontinent Aircraft Corp.; plant 500,000
Fla., Miami—Southern Bell Telephone & Telegraph Co.; office addition 36,700
Fla., Tampa—Citro-Dry, Inc.; livestock feed plant 80,000
Fla., Tampa—Continental Can Co.; warehouse .....

Ga., Atlanta—Delta Air Lines; hangar 100,000
Ga., Atlanta—Scripto Manufacturing Co.; building .....
Ga., Atlanta—West Brothers Sheet Metal Works; building
Ga., Hapeville—Tyler & Company; printing plant 75,000
Ga., LaGrange—Callaway Mills; auditorium 153,900
Ga., LaGrange — Georgia Highway Express, Inc.; freight terminal 11,000

La., Baton Rouge—Standard Oil Co. of Louisiana; rubber plant .....
La., Lake Charles—Watson Ice Cream Co.; plant 23,230

Md., Baltimore—Bethlehem Shipbuilding Corp.; woodworking shop 90,000
Md., Baltimore—Consolidated Gas, Electric Light & Power Co.; alterations .....
Md., Baltimore—Crown Cork & Seal Co.; building .....
Md., Baltimore—E. M. Davis; building .....
Md., Baltimore—Eastern Rolling Mills; alteration .....
Md., Baltimore—Gunther Brewing Co.; bottling house ...
Md., Baltimore—William Kneis; foundry .....
Md., Baltimore—Koppers Company; mill building .....
Md., Baltimore—Rowan Controller Co.; warehouse .....
Md., Cumberland—Baltimore & Ohio R. R.; engine house alterations 64,000
Md., Cumberland—Celanese Corporation; yarn warehouse 210,000
Md., Hagerstown—Fairchild Aircraft Co.; plant .....
Md., Owings Mills—Hunter Baltimore Pure Rye Distillery, Inc.; warehouse .....
Md., Relay—Calvert Distilling Co.; addition .....

Miss., Ellisville—City; hosiery mill 41,699
Miss., Gulfport—Teche Greyhound Lines; bus terminal ....
Miss., Natchez—Armstrong Tire & Rubber Co.; warehouse
Miss., Picayune—L. O. Crosby; tung oil crushing mill .....

Mo., North Kansas City—American Brake Shoe & Foundry Co.; improvement program 50,000
Mo., North Kansas City—Uhrich Supply Co.; building ...
Mo., St. Louis—Barry, Wehmiller Machinery Co.; factory addition 20,000
Mo., St. Louis—Hussmann Ligonier Co.; factory addition... 15,000
Mo., St. Louis—Illinois Terminal R. R. Co.; freight house 20,000
Mo., St. Louis—John C. Kupferle Foundry Co.; foundry addition .....
Mo., St. Louis—Monsanto Chemical Co.; building 75,000
Mo., St. Louis—Seco Sales Co.; addition 25,000
Mo. St., Louis—Sterling Aluminum Products, Inc.; factory building 28,000
Mo., Springfield—F. A. Milling Co.; grain elevator 20,000
Mo., Weldon Spring—Atlas Powder Co. (Government owned); TNT and DNT plant 11,325,000

N. C., Charlotte—American Cyanamid & Chemical Corp.; office building .....
N. C., Gastonia — Howard Brothers Manufacturing Co.; clothing plant 20,000
N. C., Newton—Burlington Mills; mill building .....
N. C., Rocky Mount—Sidney Blumental; dyeing and finishing plant .....
N. C., Wilmington—J. W. Jackson Beverage Co.; bottling plant .....

Okla., Oklahoma City—Carpenter Paper Co.; building ... 100,000
Okla., Oklahoma City—Tom Cooper; bus station 60,000

S. C., Greenville—Union Bleachery; addition .....
S. C., Inman—M. R. Murray & D. C. Strother; packing shed 10,000

Texas—Madaras Steel Corp.; plant machinery .....
Texas—Southwestern Bell Telephone Co.; repeater buildings
Tex., Baytown—Humble Oil & Refining Co. (Government owned); toluol plant 11,857,000
Tex., Dallas—Dallas Power & Light Co.; improvement program 600,000
Tex., Dallas—North American Aviation, Inc.; airplane plant 7,000,000
Tex., Edinburg—Missouri Pacific Lines; packing plant ....
Tex., Falfurrias—LaGloria Corporation; recycling plant ..
Tex., Gainesville—E. B. Osburn; locker plant .....
Tex., Houston—Joe Levit; warehouse 150,000
Tex., Orange—Consolidated Steel Corp.; shipbuilding plant 5,000,000
Tex., Orange—Orange County Milk Co.; creamery 25,000
Tex., Uvalde—Uvalde Coca-Cola Bottling Co.; plant .....

Va., Glasgow—Blue Ridge Company; addition .....
Va., Martinsville—E. I. DuPont de Nemours & Co.; nylon plant 11,000,000
Va., Newport News—Chesapeake & Potomac Telephone Co.; building 1,000,000
Va., Norfolk—Seaboard Air Line Railway; cars 1,500,000
Va., Roanoke—Pepsi-Cola Bottling Co.; plant 10,300

South—Atchison, Topeka & Santa Fe Railway; equipment
South—Louisville & Nashville R. R.; equipment 4,000,000
South—Missouri Pacific Railway Co.; steel rail 176,000
South—Santa Fe Railway; equipment .....

Contracts Proposed

Ala., Birmingham—Tennessee Coal, Iron & Railroad Co.; plant expansion .....

Arkansas — Paul W. Cleveland (representative); chemical plant .....
Ark., Newport—D. H. Burton & Dave Hare; rice mill .....

Fla., Apalachicola — Wallace Quinn Menhaden Fisheries; fish oil and fish meal plant .....
Fla., Daytona Beach—Ridgway Transfer Co.; warehouse 20,000
Fla., Homestead—Standard Oil Company; service station..
Fla., Jacksonville—Jacksonville Brewing Co.; improvements 50,000
Fla., Miami—Orange State Oil Co.; service station 19,250
Fla., Tampa — Tampa Wholesale Produce Market; fruit packing house .....

Ga., Atlanta—American Oil Company; service station .....
Ga., Atlanta—Westinghouse Electric & Manufacturing Co.; building .....
Ga., Brunswick — McCrary Engineering Co., Inc.; tractor plant .....
Ga., Macon—Reynolds Metals Co.; munitions plant 1,000,000
Ga., Monroe—Piedmont Refrigeration Association; meat curing plant 25,000

Ky., Tyrone—Kentucky Utilities Co.; steam plant 3,000,000

La., Jefferson Island—Jefferson Island Salt Co.; plant rebuilding .....
La., New Orleans—Southern Bell Telephone & Telegraph Co.; warehouse and office .....

Md., Baltimore—Irving J. Applefeld; service station .....
Md., Baltimore—E. Collins; service station .....
Md., Baltimore—Globe Brewery; alterations and additions
Md., Baltimore—Kingston Cake Company; bakery .....
Md., Baltimore—Reliable Motors Corp.; service station ...
Md., Sparrows Point—Bethlehem Steel Co.; pipe warehouse
Md., Sparrows Point—Bethlehem Steel Co.; service building

Miss., Jackson—Armour & Company; remodeling 20,000
Miss., Pass Christian—Gulf Gasoline Co.; service station .. 12,000

Mo., Independence—Remington Arms Co. (Government owned); arms ammunition plant .....
Mo., St. Louis—Clark's Super Gas Company; gas plant.... 50,000
Mo., St. Louis—Continental Can Co., Inc.; plant 1,000,000
Mo., St. Louis—Curtiss-Wright Corporation; plant addition 8,000,000
Mo., St. Louis—Gereke-Allen Carton Company; plant ...
Mo., St. Louis—Velvet Freeze Ice Cream Co., Inc.; alterations .....

North Carolina—Nantahala Power & Light Co.; hydro electric project .....
N. C., Badin—Carolina Aluminum Co.; addition .....
N. C., Charlotte—American Cyanamid & Chemical Corp.; expansion program .....
N. C., Charlotte—H. M. Wade; building 200,000
N. C., Greensboro—Atlantic Greyhound Corp.; bus terminal
N. C., Marion—McDowell Cooperative Dairy, Inc.; plant 20,000
N. C., Raleigh—Atlantic Greyhound Lines; terminal .....
N. C., Shelby—Star Publishing Company; publishing house
N. C., Statesville—Eagle-Sample Monument Works; marble plant .....

S. C., Blackville—Simon Brown's Sons; gin .....

Tenn., Memphis—Fire & Termite Prevention Co.; Chemical plant .....
Tenn., Memphis—Memphis Light, Gas & Water Division; gas meters, etc. .....
Tenn., Nashville—Nashville Linen Supply Co.; laundry 150,000

Texas—Magnolia Pipe Line Co.; pipe line .....
Tex., Beaumont—General Box Company; plant .....
Tex., Beaumont—Southwestern Bell Telephone Co.; building 1,000,000
Tex., Brownsville—Frank M. Bellanca; aircraft plant ...
Tex., Corpus Christi—Gulf Oil Corporation; two service stations .....
Tex., Dallas—Dallas Railway & Terminal Co.; busses 21,350
Tex., Dallas—Robertson Aircraft Corp.; plant .....
Tex., Dallas—Southern Aircraft, Inc.; airplane plant .....
Tex., Denison—Kraft Cheese Company; addition .....
Tex., Fort Worth—American Eaglecraft Co.; airplant plant expansion .....
Tex., Harlingen—Knapp Motor Co.; building 15,500
Tex., Houston—Independent Compress Co.; plant improvements .....
Tex., Houston—Republic Steel Corp.; office building..... 10,000
Tex., Houston—Winter Furniture Company; plant addition 30,000
Tex., Mission—Tyrrell & Garth Company; plant addition
Tex., Orange—Bechtel-McCone-Parsons; shipbuilding plant 5,000,000
Tex., Port Arthur—General Motors Corp. & U. S. Navy; four steel vessels .....
Tex., San Antonio—Frito Company; plant addition .....

Virginia & West Virginia—Marshall Haney; manganese mines .....
Va., Bedford—Virginia Rubatex Corporation; office building
Va., Harrisonburg—H. F. Byrd, Jr.; newspaper building 25,000
Va., Norfolk—Norfolk Southern R. R. (receivers of); equipment 938,000
Va., Norfolk—Norfolk Union Bus Terminal, Inc.; bus terminal 250,000
Va., Norfolk—Norfolk & Western Railway Co.; improvements 5,000,000

W. Va., Charleston — South Charleston Naval Ordnance Plant; remodeling .....
W. Va., Clarksburg—Baltimore & Ohio R. R.; garage .....
South—Seaboard Air Line Railway; equipment .....

A MESSAGE FROM MARCIA

1 **JOE BRACKEN,** traveling a new territory for Scott & Barnard, Inc., came in from a hard day. . . . The business was there, but tough to get. New prospects, unfamiliar faces, all along the line. . . . Wearily, he began to unpack. . . . On the front of his last clean shirt, he found a note.

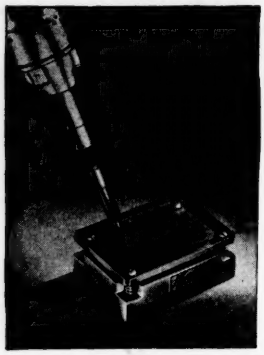
2 **WOBBLY PENCIL LETTERS!** A little smudged where Marcia had struggled to pin it on. Four kisses too. . . . Precious kid! . . . Must be hard to love a Dad you seldom see. . . . Maybe he *could* keep closer to her — to *all* the family — by calling now and then. . . . Joe grabbed the telephone.

3 **ACROSS THE MILES** came his wife's welcome voice . . . Marcia's happy squeals . . . the exciting news that little Joe had climbed a couple of steps under his own power. Joe was still grinning as he hung up. . . . A family worth fighting for! A new day tomorrow. . . . He whistled softly as he went on unpacking.

New Ways of Doing Things

Device Speeds Screw Driving Operations

With the announcement of a new method of handling screws on assembly operations for attaining more speed, the THOR "Pix-Up" Finder and Adjusto-Tray have been introduced by the Independent Pneumatic Tool Company, Chicago. This new method, it is claimed, will increase by 3 to 9 times in many instances the already established efficiency of power driving of screws. Not magnetic,



THOR "Pix-Up" Finder and Adjusto-Tray

but entirely mechanical, the device is simple in design and operation. It consists of the Adjusto-Tray, a novel arrangement of a screw-holding tray, which is spring mounted on a base and adjustable by clamp screws at each of four corners for the particular length of the screw to be driven. All THOR portable power screw drivers, pneumatic as well as Universal and High Frequency electric, can be equipped with the new THOR "Pix-Up" Finder for driving all types and sizes of screws.

Clark Fork Truck of 7000 Pounds Capacity

The Clark Tructractor Division of Clark Equipment Company, Battle Creek, Mich., announces a lifting, carrying, tiering fork truck that will handle loads as heavy as 7000 pounds and tier them in piles 15 feet high and higher. Called the "Utilitruc," this new finger truck is claimed to be particularly efficient in car loading and unloading operations, in utilizing storage capacity to the full by high stacking, and in serving production machines with materials and parts from storage. It is gas-powered and is capable of 24-hour continuous operation. The unit is made in several models, including straight lift, tilting and telescopic tiering. Minimum height is 61½ inches and minimum capacity one ton. It travels at speeds from 1 to 7 miles per hour, climbs ramps under load, has rear wheel steer and hydraulic brakes. The lifting unit is powered with an hydraulic vane type oil pump driven by special direct drive from motor and runs constantly at two-thirds engine speed.

Reo Announces New Truck Models

Three new models have been added to the line of motor trucks manufactured by Reo Motors, Inc., Lansing, Mich., and increased production facilities enable the company to make immediate deliveries on these models as well as other models of Reo's 1941 line. One of the new units, with gross rating of 22,000 to 30,000 pounds, is powered by the Reo Gold Crown 404 cubic-inch engine and is designated the "Motor Carriers Special." It is designed for hard grind long-haul service and is available in tractor wheelbases from 120 inches up. Two other models have gross ratings of 35,000 to 40,000 pounds and are powered by the Gold Crown 310 cubic-inch engine. Rear axles are double reduction type. All Rea models are from 2½ tons up are available with full Westinghouse air brakes—hydraulic brakes standard. Major features claimed for these heavy duty models are: Easy maneuverability; increase of 18 to 20 inches in loading space on shorter wheelbases; rubber mounted power plants; heavy duty, full floating rear axles and drop-forged Spoksteel wheels.

"Curled Chip" System of Metal Sawing and Precision Sharpener

According to engineers of E. C. Atkins and Company, Indianapolis, Ind., the "Curled Chip" System of high speed metal sawing is already proving its value in difficult production operations.

This system of metal cutting depends on cutting with a rolling, coiling action rather than a pushing or telescoping action. The chips are coiled into the specially curved gullet and spring clear from the end of the cut when tension is released. It is pointed out that the Atkins "Curled Chip" System differs radically from the action of the conventional hacksaw blade since it eliminates the tendency to grind the chips into fine pieces.

One Diagram Showing Crushing, Telescoping Action of Conventional Saw Teeth—Other Showing Crisp, Rolling Action of the Atkins "Curled Chip" Blade

To meet the need for an automatic precision grinder to sharpen the "Curled Chip" saws, the Atkins Company, which originated this new saw tooth blade, collaborated with Covel-Hanchett Company in the development of the No. 11-30 Metal Saw Sharpener. For preserving the scientific set of the "Curled Chip" tooth forms, the new sharpener is controlled by special cam action for the exact clearances of high and low teeth as well as precise beveling. Antifriction bearings are employed for all working parts.

Metzgar Gravity Conveyor and End-Wood Truck Wheels

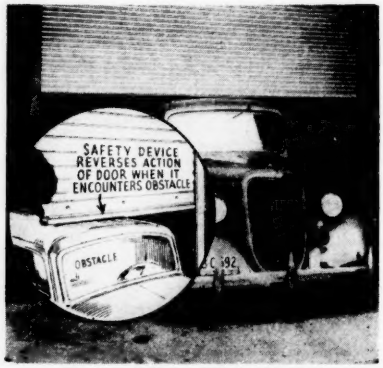
Light weight gravity conveyors of the movable or fixed types, and three types of floor-saving and unbreakable End-Wood wheels to fit any type of truck or caster fork, including complete casters for all trucking purposes, are featured by the Metzgar Company, Grand Rapids, Mich. The wheel conveyors are inexpensive and especially suited for speedy handling of boxes, cartons, cases and almost everything reasonably uniform in size. The End-Wood wheels are made to fit all sizes of trucks or caster forks and may be ordered with oilless End-Wood bearings, ball bearings or Hyatt roller bearings. They are also made to receive or be fitted with any any other type of anti-friction bearing.

Binary Slide Rule

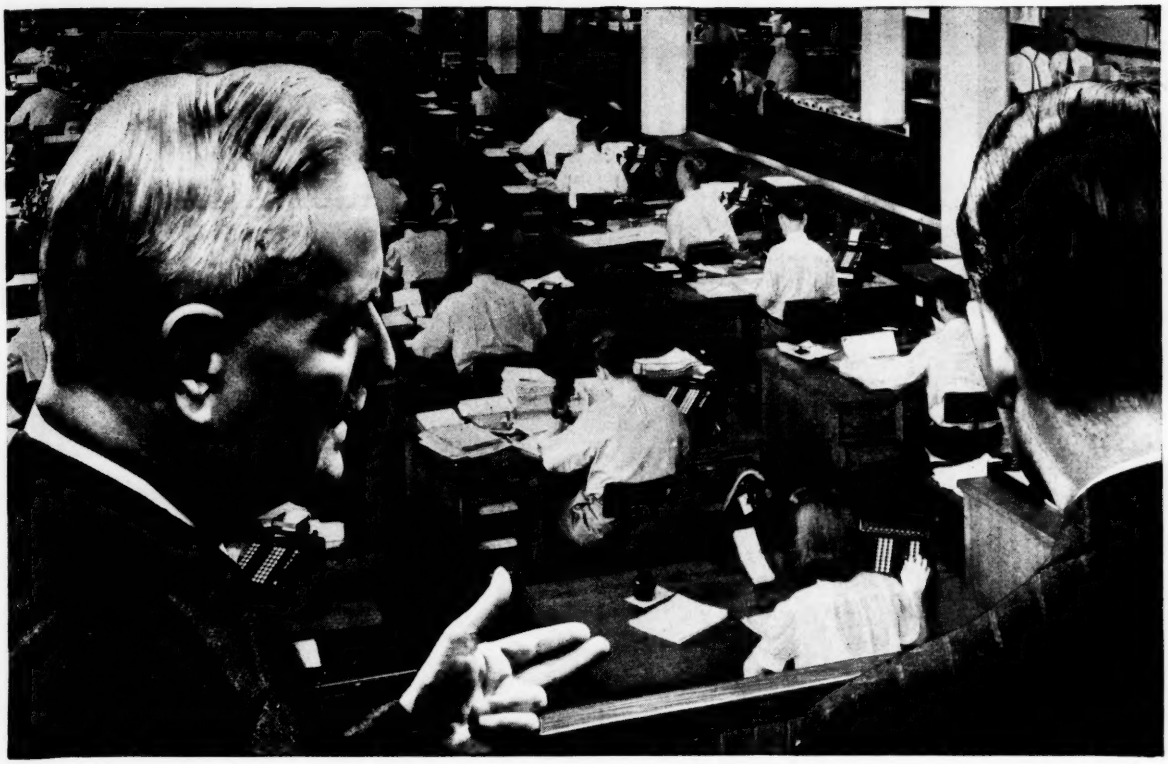
Made of white enameled aluminium and so designed that it may be used for hours without causing eye-strain, the Binary Slide Rule has been introduced by the Gilson Slide Rule Company of Stuart, Fla., makers of slide rules since 1915. The Binary, with the high accuracy of its engine-divided scales, is easy to learn, solves problems quicker than the ordinary rule, it is claimed, and requires fewer settings.

Door Safety Device

The Kinnear Manufacturing Company, Fields Avenue, Columbus, Ohio, announces an ingenious, automatic safety control for Kinnear motor operated rolling doors as well as other types of Kinnear upward-acting doors. Through its application, the possibility of injury to persons or damage to cars is greatly reduced in case doors are carelessly closed by attendants who fail to note whether or not the opening is completely cleared when they push the control button. The device works as follows: A compressible, air-containing weatherstrip is placed along the entire length of the bottom edge of the door. In case the door contacts an obstruction upon closing, it compresses the weatherstrip which forced air through an impulse switch, causing the door to stop or revert to its fully open position.



Kinnear Door Safety Device



"UNDISCOVERED *Profits* RIGHT IN OUR OFFICE"

"In the factory we cut costs with better methods and more modern machinery; now let's further add to our profits by doing the same thing in the office."

Profits which lie undiscovered in the office can be fully as tangible as any that are gained by modernizing the factory—especially in view of the new time-saving features provided by today's Burroughs machines which save so much time, effort and money in the handling of office records. These new machines and features offer surprising new possibilities for reducing office costs, as well as for meeting today's changing conditions.

The first step toward availing yourself of these "undiscovered profits" is to consult with your local Burroughs representative. He can tell you what today's Burroughs machines, features and methods can do for you, and save for you, in your office.

BURROUGHS ADDING MACHINE COMPANY • DETROIT, MICHIGAN

THESE OFFICE SAVINGS WERE ADDED TO PROFITS

A store in Ohio reduced sales audit cost 20% with Burroughs Electric Duplex Calculators which provide group totals and a grand total in one handling of the figures.

•

A New England manufacturer saved $125 a month in the cost of keeping payroll records by installing a new Burroughs that writes several related records in one operation.

•

In buying 754 Burroughs calculators, a Mid-west concern saved $118,462.88 because the Burroughs range of calculators is so complete that the exact style and size required for each desk could be purchased—without overbuying.

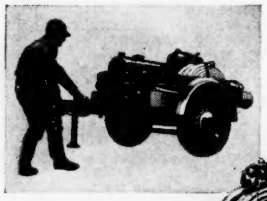
Today's Burroughs

DOES THE WORK IN LESS TIME—WITH LESS EFFORT—AT LESS COST

Your own fire department—independent of your power plant or water system because it carries its own engine and pump—is now a possibility at reasonable cost. The LaBour Fire Trailer provides 150 gallons per minute at 100 lbs. pressure, carries 500 feet of hose, and can be handled entirely by one man when necessary.

For outlying factories or mills, and for country estates or farms, this unit brings the kind of protection a city fire department provides —but *on the ground,* and not miles away. Get details and illustrated bulletin now. They're free.

Remember, fire may strike at any moment.



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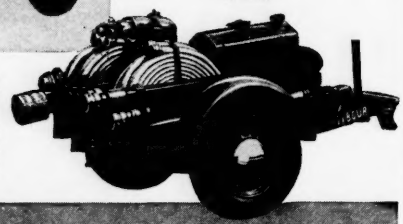
Elkhart, Indiana
U.S.A.



One man can move and operate the LaBour Fire Trailer, or attach it to any passenger car to go to the fire. Pumps from pond, stream or cistern. Dirtiest water will not harm pump.

LABOUR FIRE TRAILER

FINANCE » » » and « « « INDUSTRY

Ease the Brake

Congress is deferring action on important matters until the new Congress meets in January. Revision of taxes, changes in the Labor Relations Act and other legislation which goes to the heart of what private enterprise needs to move forward with confidence, are among the measures that need prompt clarification and adjustment.

While it is recognized that to pay the bill which will be created by the national defense emergency more taxes will be required, the tax schedule should be simplified to a degree that will not require a technician to unravel it. A study of financial reports issued this year by large corporations shows the extent of the tax load they are bearing which in many instances have made it difficult, in connection with the higher price that labor is costing, to give stockholders a fair return on their investment. The obvious result has been to act as a brake upon new investments in private enterprise, and as a jam in the orderly progress of industry that should do much to keep the wheels turning when the present emergency passes.

Secretary Morgenthau has proposed a study of the entire tax situation including relation of Federal taxes to state and local taxes. The total burden has been tremendous and it is important that the study proposed be put in the hands of experts who recognize the essential place that private industry occupies in our economy, whether it be a time of emergency or of peace.

Christmas Club Distribution

According to Christmas Club, New York, it is anticipated that $365,000,000 will be distributed to more than 7,500,000 Christmas Club members by approximately 4,800 banking and savings institutions this month. This is about 4½ per cent in excess of 1939. The average distribution per member is estimated to be $48.50.

Cut Out Unnecessary Spending

The Beaumont *Enterprise* refers to a meeting held in Washington by administration economists, and the recommendation made by an advisor of the National Defense Commission to the effect that as pump priming had not worked in the past it would be necessary to spend from $12,000,000,000 to $16,000,000,000 a year to absorb all unemployment, whereas government deficit spending has amounted to only $3,000,000,000 or $4,000,000,000 a year.

In its comment the *Enterprise* declares it is not surprising that some of the business men who attended the conference "emerged from it in a dazed condition," and adds "according to this theory, if pouring a certain number of dollars down a rat hole does not work, the remedy is to pour four or five times as many."

While the advocates of deficit spending admit its failure, they seem to be constantly unwilling to reduce the outlay for things that have proven futile. Sensible people recognize that the first order of the day is to build our defenses so completely that no nation, or combination of nations, dare attack us. These same people know that all of this necessary program is going to cost an awful lot of money. Taxes are bound to mount and prices are likely to rise as wages increase and new billions are put into circulation. We have the ele-

(*Continued on page* 50)

CONSIDER VIRGINIA

You may be studying Virginia as a new location for your factory or the establishment of an additional plant. First and Merchants will be glad to consult with you and to help you obtain reliable information which would be useful to you in reaching your decision.

First and Merchants is Richmond's oldest and Virginia's largest bank—a useful bank for many Southern manufacturers since 1865.

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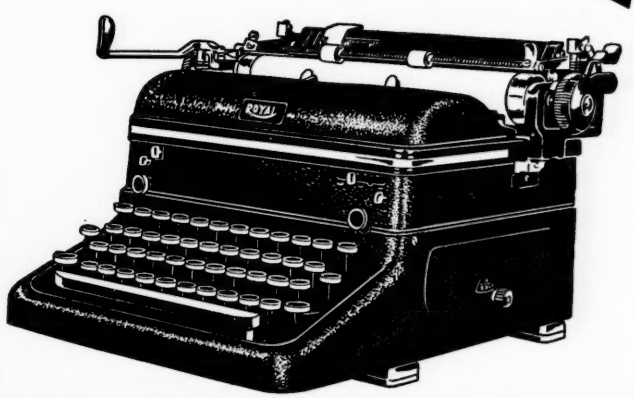

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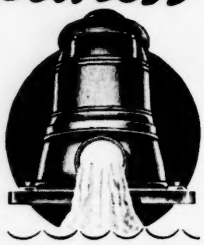

—Remember that water has always been, is now, and forever will be one of your most vital needs. It is an absolute necessity for MEN, MACHINERY AND MATERIALS. Your present water supply may not be adequate for expansion—or emergency. It may be costing you too much. It may need enlarging.

Now is the time to practice preparedness. Without delay you may secure the cooperation of Layne Engineers who will check your present water supply and offer valuable recommendations on increasing volume or the lowering of operation cost. Behind these Engineers stand the world's foremost water developers; an organization equipped and capable of making dependable preliminary investigations, reconditioning old wells, drilling new ones, furnishing and setting pumps for a complete Well Water Supply System.

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For Municipalities, Industries, Railroads, Mines and Irrigation

Finance *and* Industry

Cut Out Unnecessary Spending

(*Continued from page* 48)

ments in all of this of an inflationary program that will call for extraordinary efforts to keep it within bounds.

The specter of a further devaluation of the dollar looms large, and yet there is apparently little effort to stop foolish, unnecessary spending by government. Those who continue to cry out against an unbalanced budget are as voices in a wilderness. Men of common sense know we cannot keep on spending more than we take in without having disaster as the result. The defense enterprise is essential; everyone admits it, but it is not a self-perpetuating income producing enterprise such as marks progress in human affairs. The complete cutting out of unnecessary extravagance by government is an imperative necessity.

A Temporary Prosperity Period

As business moves forward under the impetus of defense spending, it is apparent that activity is widespread. The Cleveland Trust Company says in its Bulletin, "this expansion of business activity has all the outward appearance of the beginning of a period of self-sustained prosperity, but, of course, in reality it is nothing of the sort. This expansion of production, and this calling back of the unemployed to places on the pay rolls, does not result from free enterprise competing for business in open markets. It comes instead from a situation in which two great customers, the United States and Great Britain, are demanding huge volumes of special goods and paying what they must to get them in the shortest possible time."

And then it adds, "this apparent prosperity period of our preparedness effort gives us an opportunity to prepare our domestic defenses against its ultimate inevitable let-down. This is the time to revise our tax laws to encourage enterprise, and to revise our labor relations legislation so as to give employers as well as employees a square deal. The opportunity is here."

Commercial Borrowing

Banks experienced last month, especially at interior points, an increase in commercial and agricultural loans. The commercial loans were in large part from firms engaged in defense work.

According to a survey of the Department of Commerce, commercial, industrial and agricultural loans of Federal Reserve Banks increased $283,000,000 during the eight weeks ending October 23. The total reached at the date named stood at $4,746,000,000, compared with $4,292,000,000 at the same date a year previously.

An interesting question at the present time is the extent to which bankers will accept the suggestion of Mr. Jesse Jones of the Reconstruction Finance Corporation, that they lend money at 1½ per cent interest on guaranteed loans for plant enlargement for defense work. The alternative cited by Mr. Jones is that the government will lend borrowers at that rate. The opinion has been expressed in some quarters that risk may be involved in the government guarantee being effective unless as the work progresses each stage meets government approval.

It will be unfortunate if a way cannot be found to use bank funds for such financing at a time when it is difficult to employ increasing deposits, and to bring the government further into the field of private enterprise is to be regretted. Unless the government guarantee offered on such loans can be made to overcome contingencies that seem possible, the rate of interest suggested seems low even in this time of easy money.

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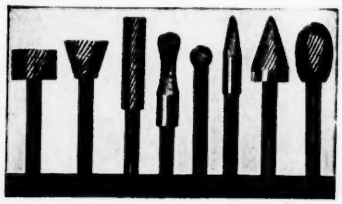

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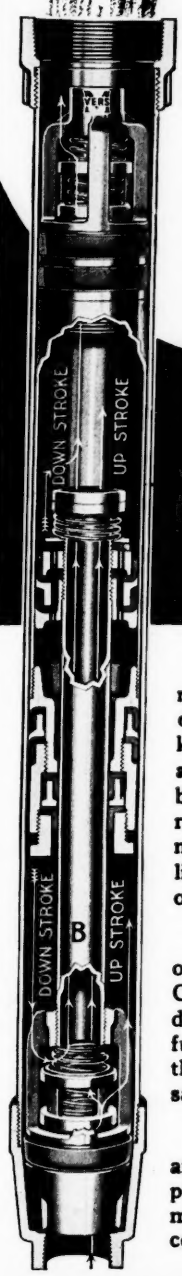

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INDUSTRIAL NEWS

Morgan Joins Carbondale Division of Worthington Pump and Machinery Corporation

Active in air conditioning and refrigeration since 1914, Earl G. Morgan has joined the air conditioning and refrigeration division of Worthington Pump and Machinery Corporation, Harrison, N. J. His headquarters will be at the corporation's Kansas City, Missouri, office. Mr. Morgan served as sales manager of the refrigeration department of the United Iron Works Company, Springfield, Missouri; was connected with Frick Company at Dallas, Texas, and for nine years was district representative of the Vilter Manufacturing Company, Kansas City. He is a member of the American Society of Refrigerating Engineers.

Charles Lucius Allen

Charles Lucius Allen, dean of industrialists of Worcester, Massachusetts, chairman of the board, and general manager for 48 years of Norton Company, internationally known manufacturers of grinding machinery and equipment, died on November 4 at the age of 82 years. Mr. Allen was one of the founders of the Merchants National Bank, which is now the Worcester Trust Company, and was chairman of the commission which built the Worcester Municipal Auditorium, after he and a few others procured the site and presented it to the city. He was a member of the commission which built the World War Memorial in Worcester, and was a life member of the board of trustees of Worcester Polytechnic Institute. Born in Worcester, he was educated in the public schools of that city and was graduated from the old Worcester High School in 1876. It was in 1881 that he formed his first tie with the company that was to become a world leader in the machine tool and abrasive industry.

McKenzie Becomes President of Sterling Pump Corporation

Henry J. McKenzie, Executive Vice-President and General Manager of Sterling Pump Corporation, Hamilton, Ohio, has been appointed president of that corporation to succeed Maurice Rothschild, who will continue as a director. Mr. McKenzie also retains his duties of General Manager. He has long been identified with the pump industry and is well known in that field. Starting in 1917 in the engineering department of Layne & Bowler Corporation, Los Angeles, he rose successively through the positions of District Manager, General Manager and Sales Manager at Memphis, Tenn. He was then appointed General Manager and Vice President of the organization, leaving Layne & Bowler to become Manager of the Turbine Pump Division of Worthington Pump and Machinery Corporation at its Holyoke, Massachusetts, plant.

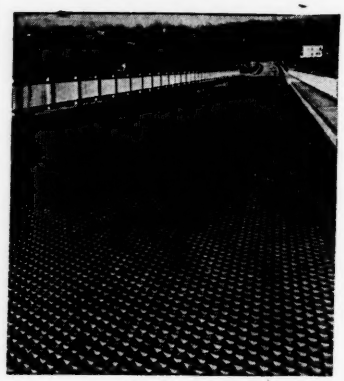
Lackawanna Railroad Establishes Atlanta Agency

Effective October 1, a new agency was established at 22 Marietta Building, Atlanta, Ga., by the Delaware, Lackawanna and Western Railroad, 140 Cedar Street, New York City, with Charles Santor in charge of office as Commercial Agent. Mr. Santor's territory will embrace Georgia, Virginia, North Carolina, South Carolina and Florida. His service with the company in the immediate past was as Traveling Freight Agent at New York. The opening of the Atlanta agency resulted from the Railroad's recognition of the increasing importance of its traffic to and from the South. A trunk line railroad, the Lackawanna provides direct service between the Atlantic seaboard and the Great Lakes ports of Buffalo, on Lake Erie, and Oswego, on Lake Ontario.

General Supply Handling Complete Line of Link-Belt Speeder Shovels

Link-Belt Speeder Corporation, Chicago, announces the appointment of the General Supply and Equipment Company, Baltimore, Md., as authorized distributor of the complete line of Speeder and Speed-O-Matic Shovels, draglines, cranes, ranging from a fast, mobile ¾-yard unit to a heavy duty 3-yard machine. While General Supply has long handled the Speeder line of crawler and truck mounted machines, ranging in capacities up to 1¼-yards, this distributor will now market also the Link-Belt Speed-O-Matic line of hydraulically-controlled machines, ranging from 1½ to 3 yards capacity. This gives them a full line of all types of convertible shovels, draglines, cranes, pull shovels—crawler and track mounted.

NOT A PENNY for MAINTENANCE



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Send for sample pages

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90 Broad Street, New York

Marvel Equipment Opens Sales Office

Marvel Equipment Corporation, Chicago, Ill., manufacturers of Chausse Tar Kettles, Marvel concrete vibrators, grinders, and breakers, announce the removal of their sales office from their factory to 224 South Michigan Avenue, Chicago. Within two or three blocks of all loop hotels, the new address offers faster mail service and is easy to reach by out-of-city dealers.

Roebling Promotes Clapp

The John A. Roebling's Sons Company, Trenton, N. J., announces the appointment of Roger H. Clapp, formerly Philadelphia Branch Manager, as Assistant General Manager of Sales with offices at Trenton. Born in Worcester, Mass., in 1893, Mr. Clapp gained his first knowledge of the wire business with the American Steel and Wire Company in Worcester, where he spent six years in the mills and eight years in sales work. In 1923 he became sales manager of the Wire Department of the Wickwire Spencer Steel Company in New York City, later becoming Eastern District Sales Manager, and in 1932 was promoted to the Sales Managership of the Wickwire Pacific Coast Division. He joined Roebling in 1936 and was appointed Manager of the Philadelphia Branch, where he remained until the present change.

All-Equip-Steel Company Completes Modern Office

General offices of All-Steel-Equip Company, Inc., in a modern **controlled conditions** structure which is outstanding for efficient planning, design and sound construction, have recently been completed at Aurora, Illinois, adjacent to the main plant of the company. Designed and built by The Austin Company of Cleveland, Ohio, pioneers in the development of windowless buildings, the new offices occupy the second floor of a 43,000-square-foot addition.

The company's office force, sales personnel and executive staff occupy 16,000 square feet of modern air-conditioned space, lighted entirely by fluorescent tubes in concealed troughs that provide continuous bands of light across the entire area. Modern warehousing, receiving and shipping facilities are also provided, thus liberating a substantial area in the existing plant for manufacturing operations which will increase production capacity.

Fluorescent lighting proved to be the most practical solution in providing efficient lighting for the large general office (160 feet by 60 feet) and 15 private and departmental offices. Details of the system were worked out by All-Steel's own engineers, in collaboration with The Austin Company and General Electric Company. Requiring 26,000 watts, the system of fluorescent tubing totals almost a half-mile in the general offices alone.

The structure is of brick and steel with concrete floors, that for the second story being supported by metal lath on open steel joists. A 2-inch layer of insulating board has been provided above the roof deck and is covered by bonded tar and gravel roofing. Air space of three feet or more has been allowed above the suspended office ceiling which is surfaced with acoustic tile. Modern functional lines give the building a high degree of individuality.

TRADE LITERATURE

ROOF CONSTRUCTION—

Form TA-5—"Roof Bonds" devoted to the construction of roofs which may be bonded to give up to 20 years' service life and the construction of steep roofs with pitch;

Form TB-3—"Membrane Waterproofing," technical literature describing waterproofing and dampproofing of concrete and brick foundations, precast concrete piles or slabs, and for waterworks and sewage disposal plants;

Form TB-4—"Dampproofing," distinguishes between dampproofing and waterproofing;

Form TA-3—"Steep Roofs Built With Coal Tar Pitch," describing the hardness, stability, insulating value and life of coal tar steep pitch roofing;

Form TB-5—"Waterproofing and Dampproofing for Waterworks," discusses circumstances under which these treatments are necessary;

Form TB-2—"Waterproofing and Dampproofing for Sewage Disposal Plants," describes the value of these applications and gives instructions for water and dampproofing seration, with other information.

Koppers Company, Tar and Chemical Division, Pittsburgh, Pa.

(*Continued on page* 54)

NATIONAL DEFENSE

Industry's No. 1 Job

by Westinghouse

• *There's probably* no single subject attracting more interest today than our National Defense program. Everyone wants to know the progress American Industry is making in producing huge stores of guns, planes, ships, tanks and munitions.

• *Right now,* several of our plants are working at top speed producing gun equipment and other machines which you would never find in the catalog of the thousands of products we manufacture. And very soon our production facilities will be substantially increased with the completion of fifteen new buildings in six different states.

• *But the manufacture* of these emergency products is only a part of the equipment our company is supplying. The electrical products that we build are a vital necessity in the National Defense program. Our long experience in designing and building practically every known electrical product is now being utilized to the limit by both government and industry alike.

• *Our plants* are working night and day to fill orders for millions of dollars worth of electrical equipment—equipment such as turbines for marine service; motors and control equipment for cargo ships; motors and generators for submarine tenders; generators and X-Ray equipment for the Army; radio equipment for all the Services; Seadrome contact lights for naval air bases; distribution and instrument transformers for shipbuilding yards. Then there are ignitron rectifiers, multiple arc welders, meters, lighting equipment, Micarta and scores of other products, all wanted in a hurry by other manufacturers who are working on important defense orders.

• *In addition* to filling these orders, we have still others from the more than 100,000 dealers and wholesalers who sell our home electrical products and Mazda Lamps.

• *All of these* are orders that *must* be filled. Neither we, nor any of our industry partners, can afford to permit any bottleneck or business stalemate occur because of lack of the equipment that we supply. We must constantly bear in mind, too, that even greater demands will be made on us tomorrow.

• *One of the most* important things our company has done to assure efficient fulfillment of all these demands is the creation of an Emergency Products Division. Through the work of this division we are maintaining *full concentration* on defense problems, but in ways that least affect the important production of our regular electrical lines.

• *National Defense* is most certainly a tall order. And we at Westinghouse, like all American Industry, consider it the most important order in our history.

TRADE LITERATURE

(*Continued from page 53*)

FURNACE PRESSURE CONTROL—
Catalog N-01A-600—illustrating and describing important new features of Leeds & Northrup Furnace Pressure Control System for Metallurgical and other Industrial Furnaces, a product which has been extensively redesigned.
Leeds & Northrup Company, Philadelphia, Pa.

WATER CONSUMPTION IN HOTELS—
Booklet—"Hotel Engineering, Volume 1, Water Consumption, Cost and Savings," prepared under the supervision of the Research Department of the American Hotel Association, by Georges C. St. Laurent, B.S., Wegg and Laurent, Consultants to Hotels, Engineering Consultant and Advisor, A. H. A. National Membership Division; first of five books to be published on various phases of hotel engineering problems and economies; tells what to do if water consumption is high, recites ways of cutting down on consumption and carries 14 pages of tables giving facts and figures on the subject from hotels of every type and size in every state; price $1.00.
American Hotel Association of the United States and Canada, 221 West 57th Street, New York, N. Y.

MACHINERY AND EQUIPMENT—
Folder—"Consider, the Cost," presenting a full list of machinery and equipment which may be bought or rented.
Equipment Corporation of America, Chicago, Ill.

ELECTRIC FURNACE CONSTRUCTION FOR LABORATORY—
Booklet—"The Construction of Electric Furnaces for the Laboratory," illustrated, prepared as an aid in the design and construction of small laboratory furnaces suitable for relatively high temperatures.
Norton Company, Worcester, Mass.

INDUSTRIAL FIRE HOSE—
Catalog Section—illustrated, presenting pertinent information on the Goodrich line of industrial fire hose for mill and office, plant protection, etc.
The B. F. Goodrich, Company, Akron, Ohio.

MAINTENANCE PAINTING—
Handbook—presenting a compilation of more than 20,000 actual analyses of painting problems in condensed form; first section devoted to discussions of the preparation of various types of surfaces, followed by suggestions of the correct paints to employ as priming coats, secondary coats and finishing coats; second section presents an analysis of conditions to which painted surfaces are subjected, and a "general" section gives information on drying, etc., while the book closes with break-down analyses of all products in the American-Marietta line—major ingredients, service records, etc.
American-Marietta Company, 43 East Ohio Street, Chicago, Ill.

WATER PURIFICATION—
Bulletin W-210-B26—illustrating and describing Worthington Pressure Filters for water purification;
Bulletin W-210-B27—illustrating and describing the Worthington Hot Process Water Softener.
Worthington Pump and Machinery Corporation, Harrison, N. J.

VALVES, PIPE FITTINGS, FIRE HYDRANTS—
Catalog 63—240 pages, cloth-bound, devoted to Kennedy valves, pipe fittings and fire hydrants, presenting complete data on bronze and iron body valves for low, standard, and higher pressures, standard bronze and malleable-iron screwed fittings, standard cast-iron flanged fittings and flanges, fire hydrants, and various valve specialties; catalog is characterized by large illustrations, with a section devoted to descriptions of valve accessories for various operating conditions; also presents recommendations for selection of valves and fittings with useful engineering data.
The Kennedy Valve Manufacturing Company, Elmira, N. Y.

THE CHEMICAL ENGINEERING CATALOG for 1940 is a volume likely to prove valuable to industrial concerns. It presents condensed and standardized data on equipment, machinery, laboratory supplies, heavy and fine chemical and raw materials "used in the industries employing chemical processes of manufacture," with classified indexes of such equipment and materials, carefully cross-referenced.

The Chemical Engineering Catalog Committee, composed of members of The American Institute of Chemical Engineers, The American Chemical Society, The American Section of the Society of Chemical Industry and Salesmen's Association of The American Chemical Industry, in a joint statement refers to the catalog as worthy of more than casual notice.

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"LITTLE BITS ABOUT BIG MEN," by B. C. Forbes, is a volume of intimate anecdotes about men who have accomplished something in the world. They are culled from thirty years' experience that has brought the author into close touch with the outstanding figures of finance and business.

In his introduction he says: "I am coaxing my sons to read it * * * and it may be too some oldsters will find parts of it entertaining." It is well worth anyone's perusal because it reflects after all that a man is a man not because of his wealth, or environment, or the clothes he wears, but because of his record of accomplishment.

B. C. Forbes Publishing Company, Inc.,
New York, $2.50.

WATERPROOF SUITS—
Folder—illustrating and describing UTE waterproof suits, dependable wet weather garments for industrial and other purposes.
Industrial Products Company, Philadelphia, Pa.

FENCE FOR PLANT PROTECTION—
Folder—illustrated, dealing with Cyclone fence for industrial protection needs, particularly plant protection.
Cyclone Fence Company, Waukegan, Ill.

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and more accurately because they are equipped with roller bearings; have patented belt feed, adjustable cut steel racks, and double acting setworks accurate to 1/32". Thousands in use. Boilers, steam engines, edgers, trimmers, power units and accessories to suit your special needs.
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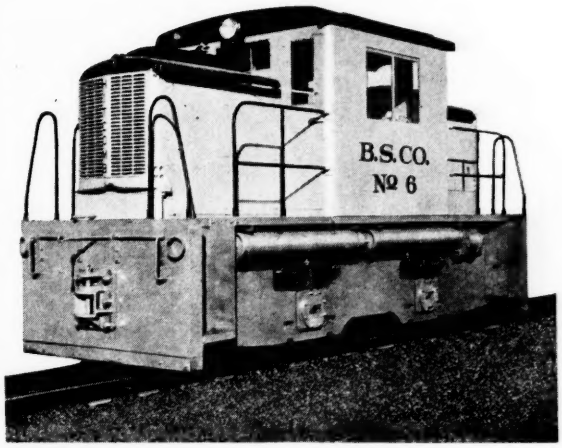

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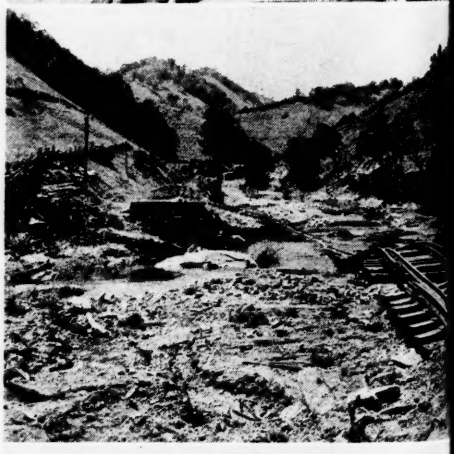
RAPID RAILWAY REPAIRS

THE Norfolk and Western Railway made a record recently in repair work necessitated on its Abingdon branch running from Abingdon, Virginia to West Jefferson, North Carolina following the flood which visited that section in the latter part of August.

Forty-four bridges in the fifty-five miles of track were either washed away or severely damaged, while road beds were undermined, tracks twisted, and ties upended. Prompt action was necessary and before the rain had stopped, engineers were on the job. With the regular labor sections of the road, augmented by forces from the neighborhood, materials and heavy repair machiney were rushed to the scene—often hauled over gutted mountain highways. The purchase of bridge timbers and other necessary lumber from local sources expedited the job, while angle-dozers, bull-dozers, and caterpillar tractors were sent on ahead to clear the debris and align damaged tracks and bridges. Bridge forces were equipped with the latest type of electrical tools for drilling, sawing, jacking, etc. Seventy-pound and one-hundred-pound rail required for replacements totalled 6,600 feet.

September 17 the line was reopened for service—two weeks ahead of schedule. The accompanying photographs show sections of the road when the waters receded as well as the restoration effected by fast and efficient work.

Before and after the repairs made necessary by the flood. Left—At top is the washed-out Bridge 72 and immediately below is the same bridge after repair. The lower center scene shows Bridge 83 washed away and track in the creek while the bottom photo taken from the same spot shows the line in place with all damage repaired. Right top and top center—Looking north across Bridge 84. Note in the upper picture where the track has been lifted up bodily and deposited on the opposite side of the creek. In the two bottom photos, before and after repairs to Bridge 73, it will be seen that not only was the bridge washed away and the track upended and twisted, but the rail itself was broken by the force of the destructive flood waters.



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DREDGING

FILLING, LAND RECLAMATION, CANALS, PORT WORKS

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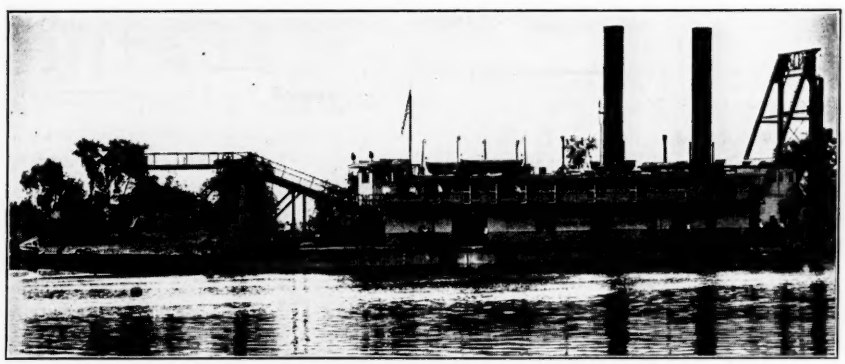

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Correspondence invited from corporate and private interests everywhere.

Contractors to the Federal Government

ATLANTIC GULF AND PACIFIC CO.

NEW YORK: 15 Park Row HOUSTON, TEXAS: Scanlan Building

Sulphur and the South

(*Continued from page* 29)

is being pushed. At Birmingham, sulphur again enters the quickly-changing picture in the form of acid employed in the pickling process for steel production. A few years ago $30,000,000 was added to the already huge investment in steel mills in this Pittsburgh of the South: one company alone built 73 new coke ovens. Construction of new sulphuric acid productive capacity in Alabama has kept pace with the increasing demands of this growing steel industry.

In Florida, sulphuric acid plants were constructed recently at Pierce and at Nichola. Farther north, in Tennessee, one of the nation's four big rubber companies is building a new $1,500,000 plant at Clarksville. At the eastern end of the state, a $15,000,000 smokeless powder plant is under construction at Memphis. This plant will be operated by an American company for the British Government. Sulphuric acid is vital in the manufacture of explosives.

In Texas, a new organization was recently formed with headquarters at Dallas to foster a series of chemurgic ventures, starting with the manufacture of dehydrated sweet potato starch, feed and by-products under a new process employing sulphur dioxide. At Dallas also, a new million-dollar soap products plant will soon be erected; sulphuric acid is used in the splitting of fats for soaps.

Houston, where more than 500 oil companies have main offices, is one of the world's top oil centers. In addition to the many refineries using sulphuric acid, new alkylation plants employing the acid as a catalytic agent to re-form waste refinery gases into high test aviation fuels are growing up in this area. A unit of this type has been put in operation also at Beaumont.

Another new addition to the impressive list of industries in Houston is a plant which will make a full line of paints, varnishes and lacquers, operations in which sulphur takes part. The contract for the plant was let recently. This largest of Texas cities also has important fertilizer, sulphuric acid and chemical plants.

A few miles south, at Texas City, construction began June 1 on a new plant to manufacture synthetic organic chemicals from refinery gases to be supplied by a nearby company. Farther south along the Gulf, Corpus Christi has become known as one of the nation's fastest growing communities. A city of few industries not long ago, it now has 23 refineries, 25 cottonseed oil mills and three soap factories.

* * *

Three signposts may be said to point the way for this great industrial migration to the South.

One is marked "resources." Not only sulphur but many other raw materials required for the diverse processes and products of this industrial age are available here in abundance, among them natural gas, salt, petroleum, lime, phosphate rock, glass sand, clay and other materials. Excellent and varied transportation facilities—railroads, inland waterways, intracoastal canals, harbors—are offered, as well as resources of power, water and labor.

Another signpost is labeled "climate"—the year-round mild weather which enables industry to obtain its raw materials without interruption throughout the winter months.

The third signpost might very well be called "attitude of the public," an attitude which is generally reflected in the tax and regulatory policies in effect. These policies for the most part have tended to attract new capital rather than repel it. In Louisiana, for example, when the state legislature raised the sulphur severance tax to $2 a ton as compared with a $1.03 rate in Texas, the pressure of opinion by civic, business, labor and other organizations which saw the move as a deterrent to new investment from outside at a time when the state was bending every effort to obtain new industries, led to a public referendum. A constitutional amendment embracing revision of the sulphur tax was adopted overwhelmingly and the rate was restored to parity with Texas.

* * *

A discussion of sulphur and the South would be incomplete without a description of some of the new agricultural developments.

In the past several years one of the major insect enemies of cotton, the flea hopper, has been combatted successfully by the use of sulphur dusts. There was little dusting against flea hopper until 1936 when an intensive educational program was launched in Texas by governmental and commercial agencies. The value of sulphur is now firmly established in grower's minds in part of the South and this use of it is attracting grower interest elsewhere in the cotton belt.

Peanut growers along the East and Gulf Coasts are beginning to employ sulphur dust for the control of leaf hopper and leaf spot. As a result, yields have been increased more than 3,000 pounds of peanuts an acre, and increases of 400 to 1,000

(*Continued on page* 64)

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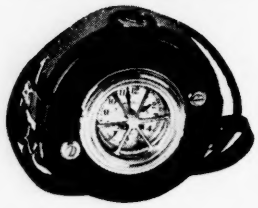

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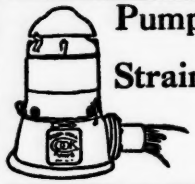

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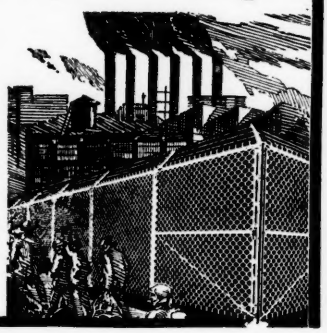

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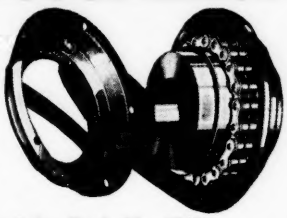

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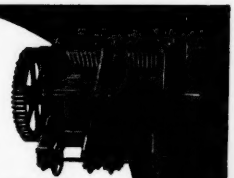

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(*Continued from page* 33)

foundation of the present vast international shipping organization.

Lykes Brothers Steamship Company, of which James M. Lykes of Houston, Texas, is President was formed by seven brothers, and is another instance of a family carrying on a business as a family. Of course, as their interests have expanded they have taken in others. Mr. F. A. Morris, now President of Lykes Brothers Cuba Company, became associated with Lykes Brothers in 1910 and in 1920 R. E. Tipton, with long experience in ocean and rail traffic, joined the organization. In 1923 he became a member of the official family as Executive Vice-President. In 1925 this company acquired the controlling interest in Tampa Interocean Steamship Company. Mr. H. C. Culbreath, one of the founders of that company, now being one of Lykes directors in charge of operations at Tampa. With the acquisition of Daniel Ripley & Company, B. M. Bloomfield became Vice-President at Houston, Texas. The Lykes Brothers family consisting now of six brothers and one sister, a nephew, Solon B. Turman, and three principle partners, Messrs. Morris, Tipton and Culbreath, work together in their efforts to develop and build a great world-wide shipping interest, serving primarily the Gulf ports.

The company maintains their own offices at major foreign ports as well as some 20 offices in the United States while their normal operations involve a crew employment aggregating approximately 2500—practically all American citizens.

What Now?

(*Continued from page* 30)

migration of industry from the North and West to the South. The trend after the present war indicates a continued and increased movement in the same direction. The South has little or no surplus industrial building space. In fact, it is underbuilt. The stream of private industrial expansion after the war should easily take up the surplus space available when war production closes down.

Amphibian Tanks

(*Continued from page* 34)

9 feet long and will accommodate 7,000 pounds of cargo. It is water tight with respect to the rest of the hull.

The hull is composed of duralumin, fabricated by riveting.

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The South from the Meat Packers' Viewpoint

(*Continued from page* 25)

business-men, all have played their part in encouraging Southern farmers to produce more diversified crops. And the chief cash producer of the diversified crops has been livestock.

It is also evident that the role which the South is destined to play in the gigantic National Defense Program launched during recent months will have far-reaching effects on the South's economic future. The same basic factors which have drawn industries southward equip the South to play an indispensable role in rearming our nation. Large army camps are springing up and yet more are

(*Continued on page* 64)

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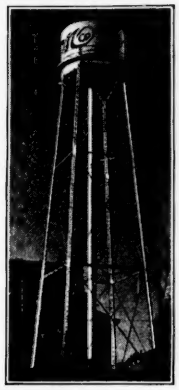

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Spotting the Future of Cotton

(*Continued from page* 31)

ing through the Cotton Stamp Plan, through its mattress allotments, through its research agencies, through its various specification writing bureaus which are leaning more and more to cotton, through its National Defense Program which probably will require approximately 800,000 bales during its first year, or 10 per cent of the production of the cotton mills, and through subsidies on new cotton products which have possibility of commercial acceptance and on cotton goods exports.

As for the various State governments in the South, we are at present in process of preparing a memorandum of co-operation. We believe that the State governments, through their various agencies, can help immeasurably in stimulating cotton consumption in the South. The people of the South wear clothes, and cotton is particularly adapted to their requirements; they buy many products which come in bags, such as sugar, fertilizer, cement and seed, which should be wrapped in cotton bags rather than paper bags. More and more industries are locating in the South; they can with profit to themselves and to their locale specify more cotton, instead of competing fibers. Banks, railroads and such great institutions as newspapers can help the good cause by putting the weight of their influence behind it.

That portion of the program which is directed at the consumer is a hard-hitting realistic program that appeals to the consumer's innate instincts to buy well. Cotton is always a good purchase. It has gone a long way during the past decade in attaining high style acceptance. Cotton today is fashion news. Women are demanding it not only for resort wear but for every kind of apparel. We hope to encourage them to demand it in even greater volume. They are demanding it, too, for home furnishings because cotton, with its variety of weaves, designs and new finishes, meets the requirements of the most exacting interior decorator. And its cost is always modest.

As for the industrial purchasing agent, who buys 40 per cent of all cotton goods sold in the United States, we are learning more about his needs. Only recently, the Institute held its 14th annual meeting at the Waldorf Astoria Hotel in New York. The meeting was devoted to the problems of cotton distribution. One of the speakers was a purchasing agent, the hard-boiled kind, but he gave the industry some of the soundest advice it has ever received as to how to sell the purchasing agent. Starting with that advice, we shall prepare during the next six months an exhaustive study of marketing methods for industrial cottons which we hope will prove invaluable to the mills.

What if we achieve the 10,000,000-bale goal? It will mean simply that we shall forever have freed ourselves from the shackles of our foreign markets. We shall no longer worry ourselves into a fit of frenzy over whether turmoil abroad will impair or destroy America's cotton empire. We shall know that any foreign business which we receive in excess of 2,000,000 bales means just so much more cotton prosperity at home.

But it will mean even more. The previously mentioned cotton-growing states' retail sales in 1939 were approximately $6,600,000,000. If the cotton mills had to process ten million bales of cotton, instead of 7½ or 8 million bales, the Southern mills would employ perhaps 436,000 persons instead of 323,661. And their wages would be more than $300,000,000, instead of $227,000,000. And the value of the product would be more than one and one-quarter billion dollars (assuming unit prices had not changed), instead of less than one billion.

To the South this would mean more purchasing power, it would mean fewer unemployed, less governmental expenditures for relief, a healthier cotton agriculture and a stronger economy. It would constitute a guarantee of prosperity for the men, women and children who live below the Mason-Dixon line.

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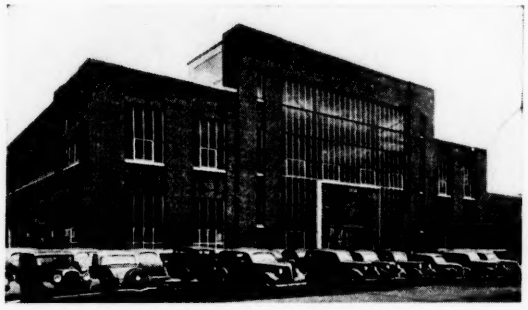
National Defense Program Awards

(*Continued from page 41*)

Unit	*Manufacturer*	*Item*	*Amount*
Qtmtr. Corps	Humble Oil & Refining Co., Houston	Facilities for the manufacture of Toluol: (a) For the construction of a new plant at Baytown. This plant will be constructed and operated by the Humble Oil and Refining Co. on a cost-plus-fixed-fee basis. (Government owned.) (Baytown Ordnance Works)	$10,760,000
		(b) For additional equipment in the existing Humble Plant	1,097,000
" "	J. M. Wood Mfg. Co., Waco	Denim working coats	21,144
" "	Williamson-Dickie Mfg. Co., Fort Worth	Denim working trousers	84,788
" "	Hicks-Hayward Co., El Paso	Denim working trousers	59,940
Ordnance	Baytown Ordnance Works, Baytown (Operated by Humble Oil & Refining Co.)	Toluol	7,800,000
"	Texasteel Mfg. Co., Fort Worth	Artillery ammunition	1,195,000
	VIRGINIA		
Qtmtr. Corps	Portsmouth Tent & Awning Co., Portsmouth	Manufacture of tents, pyramidal	18,400
" "	Old Dominion Manufacturing Co., Norfolk	Manufacture of tents, pyramidal	44,300
" "	Norfolk Tent & Awning Supply Co., Norfolk	Manufacture of tents, pyramidal	44,000
Ordnance	Crawford Mfg. Co., Richmond	Airplane pauling	189,450
Qtmtr. Corps	Hercules Powder Co., Radford	For additional facilities	10,000,000
" "	Craddock-Terry Shoe Corp., Lynchburg	40,000 pairs service shoes	115,600
Yards & Docks	W. P. Thurston Co., Richmond	For rehabilitation of submarine base facilities and construction of marine railway at the Naval station, Key West, Fla.	923,000
Qtmtr. Corps	Blue Ridge Overall Co., Christiansburg	Denim working coats	134,490
Ordnance	Ford Motor Company, Alexandria	Trucks	171,430
Chemical Warfare	Hazel-Atlas Glass Co., Wheeling	White cotton rope retaining binding and grommet rings	136,473
Qtmtr. Corps	Riverside & Dan River Cotton Mills, Inc., Danville	Sheets, ctn. bl., bed 72-in.	217,770
	WEST VIRGINIA		
Qtmtr. Corps	Carr China Company, Grafton	Chinaware	14,046
" "	J. L. Stifel & Sons, Inc., Wheeling	Cotton cloth	132,015
" "	Blue Jay Mfg. Co., Huntington	Denim working coats & trousers	340,080
" "	The Parkersburg Iron & Steel Co., Parkersburg	Parts for stoves, tent	30,390
" "	Blue Jay Mfg. Co., Huntington	Cotton mattress covers	397,301



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Lyonore Metal
CHROMIUM — NICKEL — COPPER — IRON ALLOY

Sulphur and the South

(*Continued from page* 58)

pounds are common. By enabling growers to sell at lower unit prices and still maintain profits because of these increases, dusting may very well lead to new and greater markets for this crop.

There are other new agricultural uses for sulphur in the South to be added to its many older uses in fertilizers, fungicides and insecticides. The mohair industry of western Texas now employs wettable sulphurs as a dip for the control of parasites. In Louisiana, research indicates that sulphur may be the solution to one of the most serious of poultry diseases, coccidiosis.

* * *

In the future, sulphur and sulphuric acid will undoubtedly continue to play an important role in the South's industrial and agricultural progress. Some years ago a United States Government report declared: "Sulphuric acid is today one of the absolute prerequisites of civilization." It holds the same promise for the civilization of the South of tomorrow.

Southern Management Alert to Grasp Opportunity

(*Continued from page* 24)

improvement in educational facilities, all indicate the vigour and surge of Southern development.

Normally, American MonoRail overhead handling equipment is installed to relieve floor congestion or to conserve skilled manpower. Hence when we make an installation in the South it shows that regardless of labor-cost position, management there is alert to grasp every opportunity presented.

The South from the Meat Packers' Viewpoint

(*Continued from page* 60)

planned, where troops can train outdoors the year-round in the same beneficent climate that reduces living costs for the southerner. Raw material sources of the South will be tapped to house and equip our expanding land, sea and air forces, and the bauxite, lumber, petroleum and other chemical riches of the South will play their vital parts in the defense of our nation.

Not only are numerous National Defense contracts already placed with southern firms, but large defense bases are already under way. From the shipbuilding ways of Newport News to the new air-base at Corpus Christi, from the plane factories in Kansas to the new airfields in Florida, evidence of the South's contribution to National Defense abounds in every state. Increased industrial activity and additional buying power throughout the South will follow.

Viewed from any angle, whether as a livestock producing region, as a region substantially increasing in population or as a region making significant growth and diversification of its farm and industrial income, the South commands increasing attention from the American meat packing industry.

Straight-Line Production Methods for Bombing Plane

(*Continued from page* 37)

the extensions presently being built at Middle River. More than half finished are additions to the navy and military bays, which, with a new three-story office building and an addition to the drop-hammer building, will add 400,000 square feet of floor space. More than 300,000 square feet in addition to this has been authorized by the Government at Middle River, and Mr. Martin has already announced that a final total of some 3,800,000 square feet will be needed by the company to perform its full assignment under the national defense program. Without current new construction, the company already has 1,263,000 square feet of floor space in operation. With more than 16,000 employes already on its rolls, the Martin company must raise its working force, ultimately, to between 37,000 and 40,000 people.

As it faces a growth with few, if any, precedents in American industry, the Martin company's long-range manufacturing plan should stand it in good stead.

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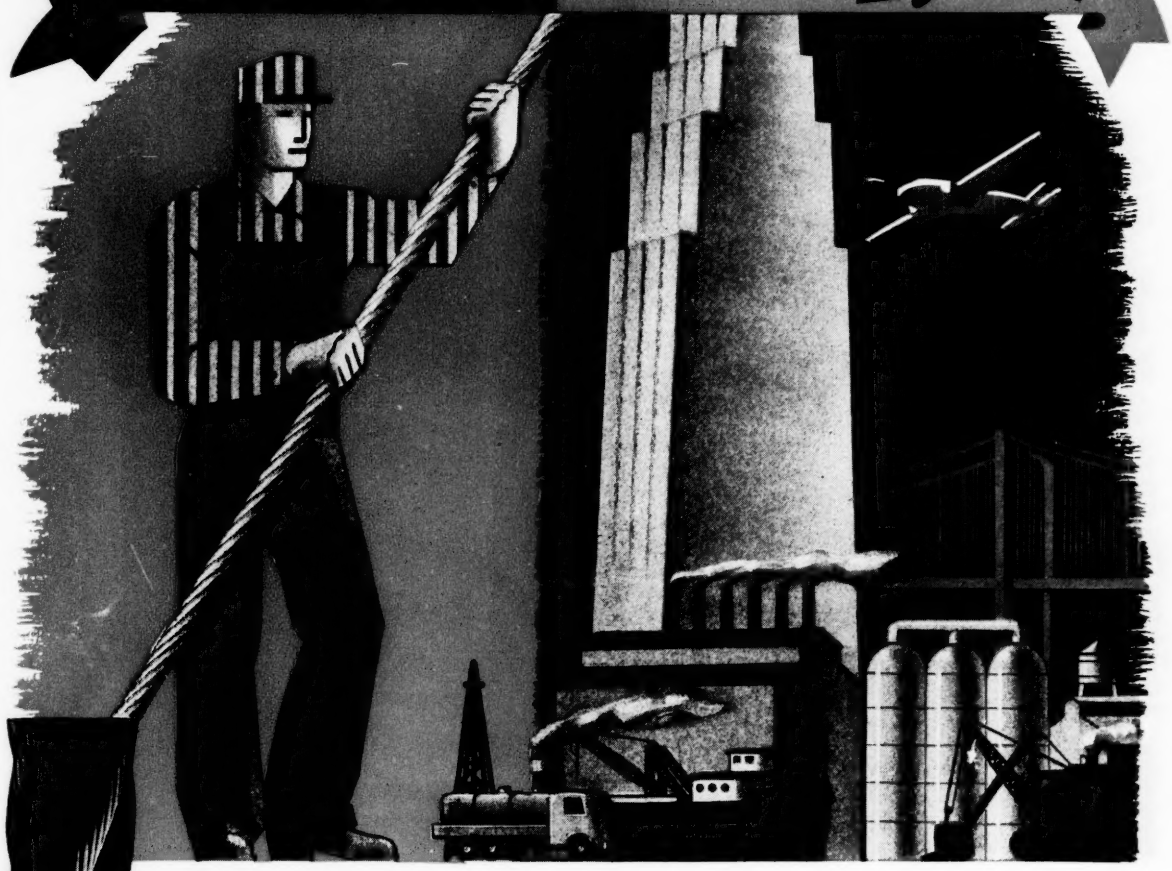

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